



# THE GOVERNOR'S COMMISSION ON THE FUTURE OF MATURE INDUSTRIES

## APPENDICES

GOVERNMENT DOCUMENTS  
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Michael S. Dukakis  
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# THE GOVERNOR'S COMMISSION ON THE FUTURE OF MATURE INDUSTRIES

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APPENDICES

June 1984

Distributed By: Michael J. Connolly,  
Secretary of State, The State Book Store,  
The State House, Room 116  
Boston, Massachusetts 02133  
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## INTRODUCTION

In order to inform itself on various topics, the Commission on the Future of Mature Industries directed its staff to conduct certain studies. The major studies are presented here as Appendices to the Commission's Final Report. The information contained herein underlaid many of the Commission's deliberations and recommendations and thereby gives a fuller picture of the Commission's work.

The studies involved analytic work, synthesis of existing information, and interviews with people knowledgeable in specific areas. Commission staff wish to thank, in particular, the corporate officials interviewed in conjunction with "Industry Studies;" the public sector officials interviewed for "Employment and Training Programs in Massachusetts;" and the private financial community who contributed to "Public Sector Resources for Businesses' Financial Needs."

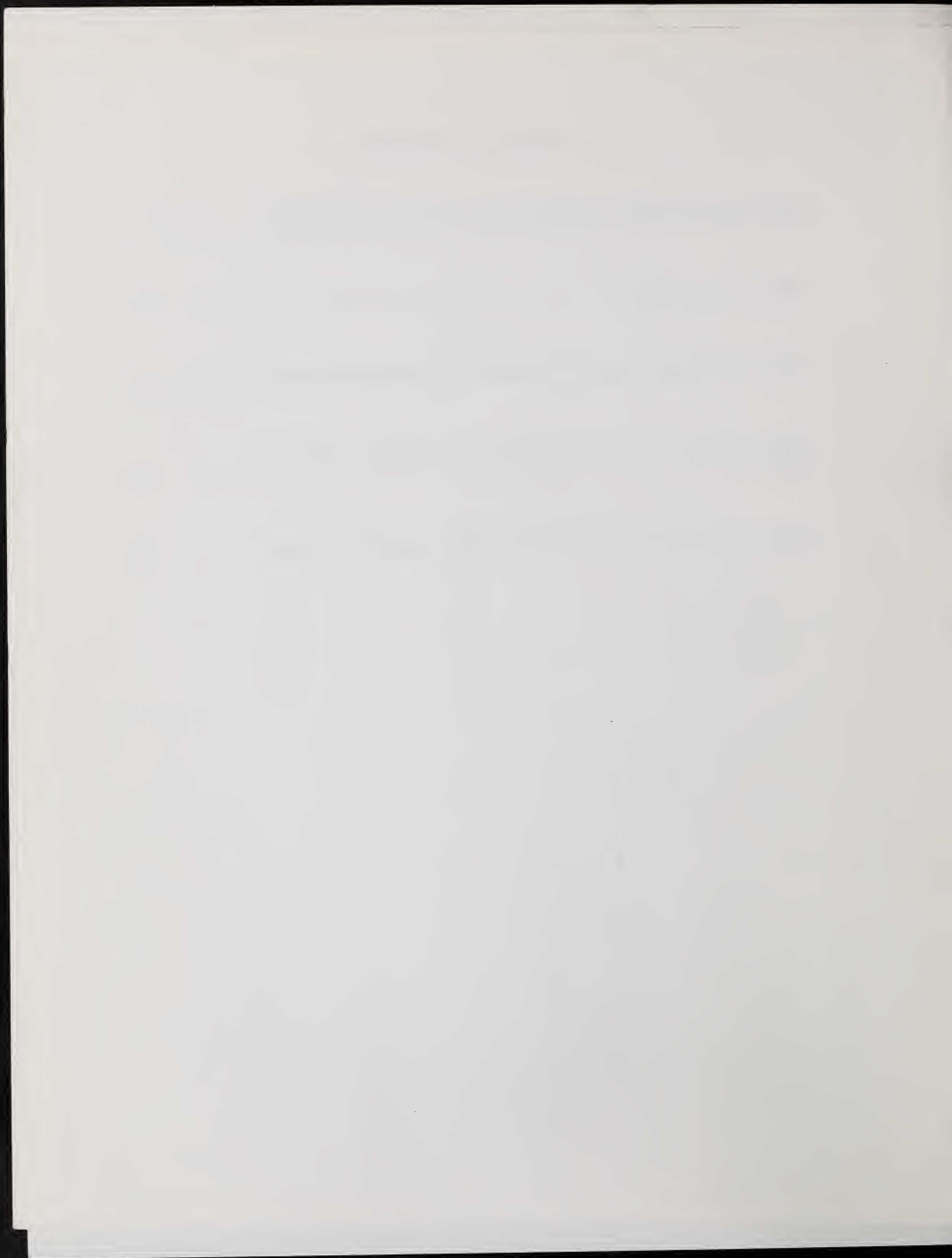
Susan Friedman, Research Director for the Commission, edited this volume and wrote "The Massachusetts Economy and Mature Industries." She and Beth Siegel co-authored "Industry Studies." Beth Siegel also wrote "Plant Closings and Mass Layoffs In Massachusetts." Judith Leff wrote "Employment and Training Programs in Massachusetts" with the assistance of Natalie Ammarel and Joan Stoia. Richard Kazis wrote "Public Sector Resources for Businesses' Financial Needs."

These studies are presented and written as separate appendices. It is hoped that they will be useful as stand alone documents.



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# THE MASSACHUSETTS ECONOMY AND MATURE INDUSTRIES

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## APPENDIX A

### REPORT OF THE GOVERNOR'S COMMISSION ON THE FUTURE OF MATURE INDUSTRIES

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## THE MASSACHUSETTS ECONOMY AND MATURE INDUSTRIES

### INTRODUCTION

This Appendix examines mature industries in the context of the state's economy. Its purpose is to show the role mature industries play in the state, while providing a compilation of economic data for both public and private sector policymakers.

Several points should be kept in mind while reviewing this material. The first is the definition used for "mature" or "traditional" industries. Conceptually, a mature industry may be defined as one with static or declining demand. Mature companies are those which have been unable or unwilling to upgrade manufacturing processes, develop new products or markets, or otherwise remain competitive.

Unfortunately, statistical categories do not reflect these conceptual definitions. At an industry level, breaking out high growth from low growth industries is not useful because within a given industry segments can vary greatly in their prospects. Companies can flourish in what is usually regarded as a slow-growth industry. For example, in the textile industry--a classic mature industry--non-woven textiles is a fast-growing segment. Companies in this segment are among the most progressive in the nation. To categorize individual companies and industry segments would be an overwhelming task.

For statistical purposes, the Commission has adopted a definition of mature industries which encompasses all non-high tech manufacturing businesses. This somewhat arbitrary statistical definition includes the following industries: food processing, lumber and wood products, furniture and fixtures, paper, printing and publishing, apparel, textiles, shoes and other leather products, chemicals, rubber and plastics, primary metal production, miscellaneous manufacturing such as toys and sporting goods, some fabricated metal products (e.g., cutlery and handtools), some non-electrical machinery (e.g., engines and metalworking machinery), and some electrical machinery (e.g., household appliances). These traditional manufacturing industries directly represent 60% of all manufacturing employment and 15% of total employment in the state.

The remainder of manufacturing jobs in the state are in the "high tech" sector. The definition of high technology industries used by the Commission was developed by the Massachusetts High Technology Council and includes industries such as electronic components, computers, instruments, and photo and optical goods. It represents those industries in



the state which typically maintain substantial research and development activity. Exhibit 1 shows the relative size of major manufacturing industries in the state. High technology industries are included in non-electrical and electrical machinery and instruments, the largest three categories. (The machinery categories also include some mature businesses.) Exhibit 2 defines the high technology industries more precisely. By this definition, high technology represents 9% of statewide employment.

Non-manufacturing sectors such as services (e.g., hotels, health care and education), finance, and wholesale and retail trade comprise the remaining 76% of the state's jobs.

A second point to remember while reviewing this Appendix is that the state's economy is strongly influenced by national business cycles, and that trends vary depending on the time periods covered. Since 1973 there have been three cycles:

- November 1973 (peak) to March 1975 (trough)
- January 1980 (peak) to July 1980 (trough); and
- July 1981 (peak) to November 1982 (trough).

A third point is that this presentation is based on data from many sources. In some cases, figures differ slightly, although trends are consistent.

In summary, the major points this analysis reveals are the following:

- The state's comparatively high per capita income levels are due to the number of people working relative to the total size of the population, not due to higher wages.
- While the state's unemployment rates have been comparatively low since 1978, the rate of job growth has also been low. Because the state's labor force has increased slowly, this lower rate of job growth has been sufficient to hold down unemployment.
- Job growth in the state has come primarily in such non-manufacturing sectors of the economy as services and trade. High technology job growth has offset the drop in mature manufacturing industries.
- The shifting nature of the state's economy has exacerbated regional differences in employment and wealth. High technology manufacturing has not developed in those parts of the state which



have suffered the loss of traditional industries.

## GENERAL ECONOMIC CONDITIONS

### Population And Labor Force Trends

Relative to the nation, population growth in Massachusetts has been slow, a trend which predates World War II. Between 1970 and 1980, population growth in Massachusetts was only .8% relative to 10.9% for the country as a whole. During this period, Massachusetts' labor force grew 16.8%, appreciably slower than the nation's average growth of 29.2% (Exhibit 3).

Relative to the U.S., Massachusetts has traditionally had a higher percentage of its working age population in the labor force (Exhibit 4). This has significantly affected the Commonwealth's ability to generate relatively high employment and per capita income.

### Income Comparisons

Traditionally, per capita income in Massachusetts has been higher than the U.S. average (Exhibit 5). While the gap narrowed in the late '70s, Massachusetts has recently increased its per capita income and it is currently 9% higher than the national average.

The favorable per capita income figures cannot be explained by higher average wages, which are actually lower in Massachusetts than the country (Exhibit 5). Nor is it due to non-wage income such as dividends or transfer payments. The composition of total income is the same in the state as in the nation.

The state's relatively high per capita income level is due to higher labor force participation rates and an older population structure, leading to more wage earners in the Commonwealth (as a percentage of total population) than for the country as a whole. In the nation, 38.4% of the population is employed; in Massachusetts, that figure is over 45%. The same argument also explains why the distribution of family income is better in Massachusetts (Exhibit 6).

### Cost Of Living And Disposable Income

The cost of living in the Commonwealth has been higher than the national average for many years. "The Family of Four Budget," compiled by the Bureau of Labor Statistics, indicates that Massachusetts is still a more expensive state to live in than the average. There are signs, however, that this gap is closing. In recent years, the Consumer Price



Index for Boston has increased more slowly than for the nation as a whole (Exhibit 7).

Real disposable income is a measure which takes into account the effects of cost of living, as well as some taxes, and which attempts to determine the "real" level of spendable income. It is derived by adjusting per capita income for inflation and subtracting personal taxes. According to the "Massachusetts Economic Policy Analysis Model" developed at the University of Massachusetts at Amherst, since 1973 the Commonwealth's real per capita disposable income has increased 6%; while the national average increase over this period has been 1%.

Property and sales taxes are not considered in calculating disposable income. They represent 63% of total state and local tax revenues. While the sales tax burden has been relatively constant, property taxes have declined due to Proposition 2 1/2. By 1982, Massachusetts had come into par with the average national state and local tax levels.

Relatively greater increases in real disposable income, combined with the relative decline in property taxes, indicate that Massachusetts citizens have been better able to maintain their living standards than the average American.

#### THE CHANGING STRUCTURE OF THE MASSACHUSETTS ECONOMY

Like the nation, Massachusetts is experiencing a shift in its economy. At the sector level, the increasing importance of services and a decline in manufacturing has been significant. The service sector increased from 12% to 26% of total state employment between 1950 and 1982. At the same time, manufacturing employment dropped from 41% to 23% of jobs. Mature manufacturing industries declined from 35% to 15%, a loss of over 200,000 jobs (Exhibit 9).

Several factors are driving this trend. Lifestyle changes and demographic shifts which involve increased use of services such as health care, cultural organizations and restaurants are two important causes. Changes within the manufacturing sector also contribute to this phenomenon. Companies increasingly use outside business services such as consulting, accounting, and marketing firms. Increased productivity has reduced the need for more workers relative to growth in output. Changes affecting the competitiveness of mature industries are discussed below.

In both relative and other absolute terms, the service sector generated by far the most net new jobs between 1976 and 1982, double the amount of new high technology jobs. In manufacturing, the growth in high technology employment more



than offset the decline in traditional industries during this period (Exhibit 10).

Due to the growth of the high technology sector, Massachusetts increased its share of national employment in durable manufacturing goods between 1976 and 1982. It has lost share in non-durable manufacturing, trade, and finance-insurance-real estate (Exhibit 11). As a result, the structure of the Massachusetts economy is oriented slightly more towards high technology and the service sector than the U.S. economy as a whole (Exhibit 12). Since 1978 enough jobs have been generated, relative to the slow-growing labor force, to provide an unemployment rate lower than the national average (Exhibit 13).

As a consequence of this structural shift in the state's economy, most of the increased employment has been in relatively low paying jobs. The service and trade sectors, which on average pay less than the average state wage, together accounted for over 72% of the increase in jobs between 1976 and 1982 (Exhibit 14).

A continuation of these trends is likely. The Massachusetts Division of Employment Security used 1981 as a base year to project 1990 employment. Over 60% of the job growth during this period is projected to be in the service and trade sectors, and only 30% in manufacturing. The increase in manufacturing employment will be primarily in high technology industries, with some traditional industries showing a decline in employment.

By assuming the real level of wages (excluding inflation) remains the same, and that productivity increases do not affect real wage levels; the 1990 projections indicate that the average real wage for the state will not change between 1981 and 1990 (Exhibit 15). There is reason to question this finding. Average state wages declined 8% in real terms between 1971 and 1980. It is not clear why this downward trend would not continue.

### The Manufacturing Sector

The manufacturing sector is a critical component of the overall strength of an economy. To a large extent, job creation occurs by expanding output in traded businesses. From a state's perspective, this means exporting more to other states and countries. While Massachusetts has several sectors such as banking, insurance and tourism which have out-of-state customers, the manufacturing sector is the major source of traded goods and a major factor in increases in employment. High technology industries are a prime example of ones which rely on other states and countries for the vast proportion of its sales.



Secondly, manufacturing jobs are particularly important because many non-manufacturing jobs and businesses depend on the manufacturing sector as a source of demand: business services, construction, and transportation are only a few of the most obvious examples. In addition, one manufacturing job generates income to be spent in ways which create jobs in other sectors. Those manufacturing jobs are also generally higher paying than average. There is a significant correlation between growth in manufacturing jobs and growth in an economy's gross domestic output (Exhibit 16).

Nationally, the trends in the manufacturing sector are not good. The U.S. has suffered a severe drop in its share of international trade in manufactured goods, dropping from 22% in 1966 to 15% in 1980. In the U.S. market, the import penetration rate in manufactured goods has grown from 4% to almost 14% during this same period. Relative to other developed countries, the U.S. has one of the most severe declines in manufacturing employment (Exhibit 17).

The reasons for this are many. As discussed in The DRI Report on U.S. Manufacturing, by Data Resources, Inc., they include:

- an overvalued dollar which penalizes exports while making imported goods cheaper
- relatively low rates of capital investment caused by high capital costs and by more severe swings in the business cycle affecting corporate willingness to invest; and
- low levels of non-defense related research and development expenditures. The DRI report found that high technology industries were affected by these trends, but not as severely as traditional manufacturing.

Massachusetts industries are, of course, also affected by these factors, and their importance varies depending on the specific industry. The "Industry Studies" appendix to the Commission's report looks in more detail at selected industries and chronicles the impact of these national factors on businesses in the Commonwealth.

Industries within any one state are affected not only by these international and national trends, but also by factors which occur on a regional basis. As a result, Massachusetts industry is also influenced by regional conditions which prompt industries to relocate within the U.S.

While this picture of the manufacturing sector is a bleak one from a national standpoint, within the state some



industries are doing well while others are declining. Between 1950 and 1982, employment in high technology industries, such as instruments, machinery, and electrical equipment, show dramatic employment gains (between 50% and 200%). While this Commission has not been charged with considering the high technology sector, its importance to Massachusetts' economy cannot be ignored. It has been the major factor in maintaining manufacturing employment levels in the state, thereby compensating for the loss of jobs in traditional industries. High technology employment growth slowed in the late 1970s and declined between 1981 and 1982, probably due primarily to the recession (Exhibit 18). However, high technology capital investment in Massachusetts has been constant since 1978, while it has been increasing rapidly in other New England states (Exhibit 19).

Mature industries, at this aggregate level, have shown widely varying patterns. The textile industry lost two-thirds of its 1950 employment by 1965. Current employment is 17% of the 1950 level. Paper products, apparel, and chemicals have been declining since the 1970s. The shoe and food products industries have been seriously declining through the entire period. Stone, clay, and glass, fabricated metals, and transportation equipment are highly cyclical industries which have shown little sustained growth over the 30-year period. Rubber and plastics have been fairly stable during the same time. Printing and publishing is the one mature manufacturing industry that has shown slow but relatively consistent growth (Exhibit 20).

Forecasting the prospects for these industries requires a closer examination of the industry segments which comprise the individual industries. In some cases, such as textiles, it is generally agreed that the industry has stabilized. For the most part, remaining firms have well-defined and sustainable market positions. In other cases, such as shoes and leather products, further declines are likely. Still other industries are likely to expand and contract over the business cycle.

The dual nature of Massachusetts' manufacturing sector--high technology and mature industries--can be seen in those manufacturing industries in which the Commonwealth has a relatively high share of national employment. While the state represents only 2.9% of the country's labor force, it has over 8% of U.S. employment in the following industries:

- leather tanning and finishing 12.6%
- optical, ophthalmic and photo equipment 12.6%
- special industry machinery 9.5%
- office computing and accounting machinery 9.2%
- footwear and other leather products 8.5%



These figures do not reflect the relative importance of these industries within the state's economy, but rather point out those industries in which Massachusetts represents a significant share of the nation's employment. They reflect the significant mix of both high technology and mature industries which characterize the state's manufacturing sector.

National and international factors such as exchange rates, business cycles, relative national interest rates, and the growth of international trade will affect total national demand. There is little, if anything, a state can do to influence these factors. By tracking a state's share of national employment by industry over time, it is possible to see how well the state is able to respond to these factors relative to the rest of the nation.

In summary, many of Massachusetts' traditional industries, which are primarily non-durables (shoes, paper, apparel, textiles, rubber, and plastics) are losing share relative to other states. High technology industries, primarily durable goods such as opthalmic equipment, instruments, electronic components, and accounting machinery, are gaining share. Several machinery and equipment industries are also gaining share (Exhibit 21).

In the "Industry Studies" appendix, a more detailed look at selected industries begins to illuminate the reasons for some of these trends. Tracking share shifts highlights those parts of the state's economy which are leading or lagging the rest of the U.S. Understanding these trends is a first step in developing programs which could promote the state's unique blend of industries.

### Declining Industries

As one of the first industrialized states, Massachusetts was invariably going to lose employment in some industries as other parts of the country developed their own manufacturing bases. As early as the 1890s, this state began feeling the impact of the textile industry's move to the South. Regional movements of industries within the U.S. and, more recently, international competition from low wage countries as well as developed nations, have caused industries in the Commonwealth to decline. Additionally, the impact of new generations of manufacturing technologies have caused employment to drop in many industries where demand has not kept pace with productivity gains.

Between 1972 and 1982, leather and leather products, textiles, apparel, food and kindred products, paper, fabricated metal products, lumber, transportation equipment, rubber and plastics, chemicals, miscellaneous manufacturing, and stone, clay and glass all had declining employment



(Exhibit 22). Printing and publishing was the only traditional industry to increase employment over this period. The total job loss was 65,300 jobs. This represents an average decline of 18% for these industries. Between 1972 and 1980 (which eliminates any possible effects of the recent recession), the job loss was 31,400 jobs (or 9% of 1972 employment) in these industries. It is of course likely that some of the job loss between 1980 and 1982 was not simply the result of the recession, but a continuing decline in the basic competitiveness of these industries.

The preceding discussion considers the Commonwealth as one economic entity. However, such a view masks significant differences in various regions. The following section looks within the state to reveal these differences.

#### THE REGIONAL ECONOMIES OF MASSACHUSETTS

The Commonwealth is made up of many regional economies. The Commission has used standard labor market areas (LMAs), defined as regions in which people are likely to commute for work, for its analysis. Exhibit 23 divides the state geographically into the ten major LMAs which represent over 85% of statewide employment. Even at this somewhat aggregated level, significant differences are apparent in the regions. Population growth is highly uneven across the state. While the Commonwealth's population grew less than 1% between 1970 and 1980, specific areas experienced a wide variety of change: Plymouth County's population grew over 20% during this period while the city of Boston's declined more than 10%. Each region has its own mix of economic sectors: only 20% of jobs in the Boston LMA are in manufacturing, but over 40% are in manufacturing in the Fitchburg-Leominster LMA (Exhibit 24).

The regions vary tremendously in size. The Boston LMA which includes many surrounding suburbs, represents almost 50% of the state's employment (Exhibit 25). As a result, statewide trends are highly influenced by what happens in the greater Boston area.

Unemployment also varies considerably among regions. The range goes from less than 3% for Nantucket to almost 12% for the Gardner, Athol and Ware LMAs combined (Exhibit 26). The low unemployment rate of the Boston LMA has a significant impact on the state average. For the period between January and September 1983, the state's unemployment rate was 6.9%, but, excluding the Boston LMA, it was 7.8% for the rest of the state.

Although the Boston LMA has a low unemployment rate, it has the greatest number of unemployed workers. Over 87,000



of the state's 208,000 unemployed workers are in the Boston LMA.

Income levels differ greatly among the regions. The disparity in wages varies from 6% above the state average for Boston to 18% below that average for Fall River. The disparity is even greater for manufacturing wages. Pittsfield's is more than 10% above the state's average, while Fall River's is 35% below the average (Exhibit 27).

Much of this disparity is a function of the different industry wage levels and the concentration of industries in selected regions. Apparel, textiles, and shoes have much lower wage levels than high technology (Exhibit 28). Almost 20% of manufacturing jobs in Brockton are in the shoe industry; 40% in Fall River and 30% in New Bedford are in apparel; 40% in Worcester are in the machining trades; and over 20% in Fitchburg-Leominster are in plastics (Exhibit 29). Fall River, New Bedford, and Brockton, because of their concentration of jobs in low-paying industries, have relatively low average wage levels for manufacturing.

This cursory look at major regions within the Commonwealth reveals tremendous variation across industries and geographic areas. Economic development patterns vary and change over time. Tracking relative unemployment rates over time shows how regions have changed vis-a-vis each other (Exhibit 30). In the period between 1975 and 1982, statewide unemployment dropped from 11% to less than 8%. But this improvement was not evenly shared. Fall River and New Bedford were in a worse position relative to the rest of the state in 1982 than they were in 1975. Lawrence and Lowell, which have attracted high technology jobs over this period, improved more than the state overall. Worcester and Springfield improved faster than the state until the late 1970s, and they have since declined.

A key issue for the Commonwealth is promoting the expansion of industry within regions with high unemployment. A preliminary look at where businesses are expanding on a county level indicates that expansions in recent years have taken place in the eastern part of the state: Essex, Middlesex, Norfolk, and Suffolk counties (Exhibit 31). The western and southeastern regions do not seem to be generating enough expansion to offset the combination of population shift and loss of jobs in mature industries.

## CONCLUSIONS

This overview highlights some of the major economic issues facing the state. It confirms the decline of many traditional manufacturing industries. From a state-wide perspective, they do not individually represent large



proportions of employment. However, because they are so important to the economic bases of various regions within the state, their decline cannot be ignored.

With the decline in traditional industries and the growth in the high technology and non-manufacturing sectors, it will be important for the state to help workers make the transition out of old jobs and into new ones. Retraining becomes critical, as well as employers' willingness to hire workers who may have different age, sex, race and education characteristics than current employees.

Historically, businesses have not expanded in those areas of the state which experienced a loss of traditional industry employment. General unfamiliarity with different regions of the state; infrastructure; accessibility to air, rail, and major highways; availability of attractive housing and school systems; and other amenities many explain this. An assessment of such characteristics for regions which need to attract more employment would begin to provide the state with a regional economic development strategy.

That many of the state's mature industries are losing share of national employment is cause for some concern. In declining industries, this means the Commonwealth is disproportionately bearing employment losses. Because of the need of many regions of the state to restructure their economic base, slowing the rate of job loss would give much needed time for these communities to attract new businesses.

In expanding industries, a loss of share means that Massachusetts is not capturing a proportionate share of employment increases. If the state's economy is to remain diverse, employment should increase in strong traditional businesses, as well as in high technology and the non-manufacturing sectors of the economy. The "Industry Studies" appendix begins to identify some causes for these trends in selected industries. Continuation of this work could provide the state with policy guidelines for understanding these phenomena.

The Commission's recommendations for a state monitoring capability, an industry-wide program capability, and new financing programs should begin to address these needs.

**EXHIBIT 1**  
**Manufacturing Employment in Massachusetts**

	<u>1982</u>
DURABLE GOODS	61.8%
Lumber and Furniture	1.8%
Stone, Clay and Glass	1.8%
Primary Metals	2.4%
Fabricated Metals	7.5%
Non-Electrical Machinery	16.4%
Electrical Machinery	17.4%
Transportation Equipment	5.2%
Instruments	9.3%
NON-DURABLE GOODS	38.2%
Food and Kindred Products	3.8%
Textile Mill Products	3.2%
Apparel	5.9%
Paper and Allied Products	4.1%
Printing and Publishing	7.2%
Chemicals	2.7%
Rubber and Miscellaneous Plastics	4.7%
Leather and Leather Products	2.9%
Miscellaneous Manufacturing*	<u>3.7%</u>
	100.0%
 TOTAL MANUFACTURING EMPLOYMENT (000s)	 640.1

\* As of 1984, miscellaneous manufacturing will be moved to the durable goods category.

Totals do not sum due to rounding.

Source: Massachusetts Division of Employment Security:  
790 Series



**EXHIBIT 2**  
**High Technology Industries Defined**

<u>CLASSIFICATION</u>	<u>SIC CODE</u>
Drugs	283
Ordnance and Accessories	348
Office Computing and Accounting Machines	357
Electrical and Electronic Machinery	361 362 363 364 365 366 367 369
Guided Missiles and Space Vehicles	376
Miscellaneous Transportation Equipment	379
Manufacturing, Analyzing and Controlling Instruments, Photo and Optical Goods; Watches and Clocks	381 382 383 384 385 386 387

Source: Massachusetts High Technology Council

**EXHIBIT 3**  
**Population Trends**  
**United States and Massachusetts**

TOTAL POPULATION  
(In Thousands)

	<u>1960</u>	<u>1970</u>	<u>1980</u>
United States	179,323	203,302	225,479
Massachusetts	5,149	5,689	5,737
Massachusetts as % of U.S.	2.9%	2.8%	2.5%

GROWTH RATES

	<u>1950 - 1960</u>	<u>1960 - 1970</u>	<u>1970 - 1980</u>
TOTAL POPULATION			
United States	18.5%	13.4%	10.9%
Massachusetts	9.8%	10.5%	.8%
CIVILIAN LABOR FORCE			
United States		19.8%	29.2%
Massachusetts		9.2%	16.8%
EMPLOYMENT			
United States		19.6%	26.2%
Massachusetts		17.8%	18.2%

Source: United States Census (1960, 1970, 1980)

Employment and Training Report of the President (1970, 1976, 1982)

**EXHIBIT 4**  
**Civilian Labor Force Participation Rates**  
**United States and Massachusetts**

	<u>TOTAL</u>	<u>MEN</u>	<u>WOMEN</u>
1982			
United States	64.0%	76.6%	52.6%
Massachusetts	67.4%	79.3%	56.7%
1975			
United States	61.2%	77.9%	46.3%
Massachusetts	64.6%	80.4%	51.0%
1950			
United States	58.3%	84.5%	33.1%
Massachusetts	53.8%	76.9%	33.2%

Source: United States Bureau of Labor Statistics: Geographic Profile of Employment and Unemployment (1975 and 1982)

United States Census (1950)

**EXHIBIT 5**  
**Average Annual Pay and Per Capita Income**  
**United States and Massachusetts**

	<u>AVERAGE ANNUAL PAY (1982)</u>	<u>PER CAPITA INCOME (1982)</u>
United States	\$16,732	\$11,107
Massachusetts	\$16,333	\$12,088
Massachusetts % of United States Average	97.6%	109%

Source: United States Department of Commerce, Bureau of Economic Analysis  
United States Bureau of Labor Statistics

**EXHIBIT 6**  
**Income Distribution**  
**United States and Massachusetts**

<u>FAMILY INCOME</u>	<u>UNITED STATES</u>	Percent	<u>MASSACHUSETTS</u>
Income Under \$5,000	7.3%		6.0%
\$5,000 - \$9,999	13.2%		11.3%
\$10,000 - \$19,999	29.8%		28.1%
\$20,000 - \$34,999	33.5%		36.6%
\$35,000 - \$49,999	10.6%		12.1%
\$50,000 and Over	<u>5.6%</u>		<u>5.9%</u>
	100.0%		100.0%

Source: United States Census (1980)



**EXHIBIT 7**  
**The Cost of Living**  
**United States and Massachusetts**

CONSUMER PRICE INDEX

	<u>BOSTON</u>	<u>UNITED STATES</u>
	(1967 = 100)	(1967 = 100)
1976	174.5	170.5
1977	183.4	181.5
1978	193.1	195.5
1979	212.9	217.4
1980	240.0	246.8
1981	266.7	272.4
1982	277.7	289.1
1983 (November)	294.0	303.1

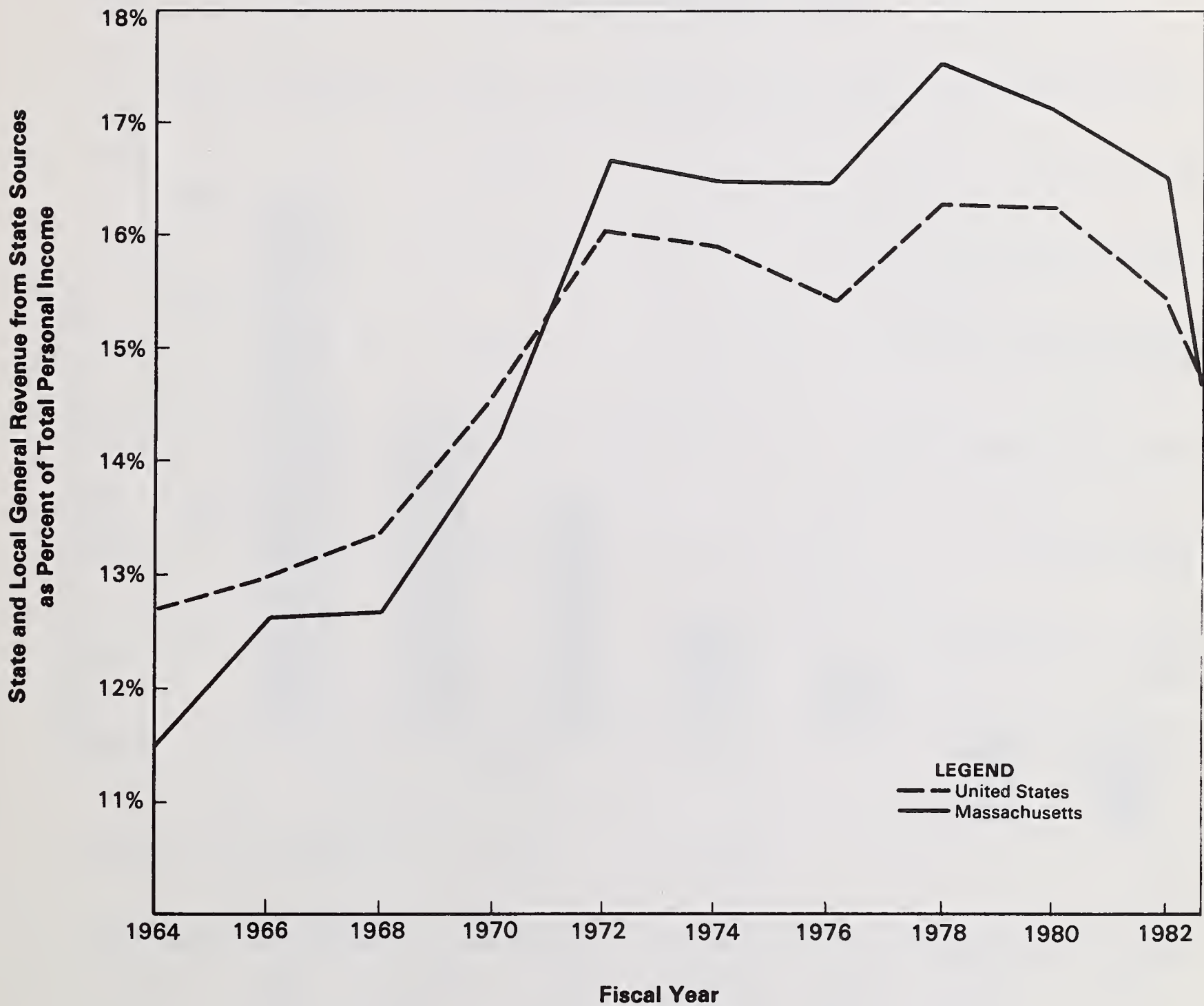
FAMILY OF FOUR BUDGET (FALL 1981)

<u>BUDGET</u>	<u>MASSACHUSETTS</u>	<u>UNITED STATES</u>	<u>MA AS % OF U.S.</u>
Low	\$16,402	\$15,323	107%
Moderate	\$29,213	\$25,407	115%

Source: United States Bureau of Labor Statistics



**EXHIBIT 8**  
**Massachusetts Total Tax Burden**



Source: United States Bureau of the Census

Massachusetts Office of Administration and Finance

**EXHIBIT 9**  
**Structure of the Commonwealth's Economy: Distribution of Jobs by Major Sector**

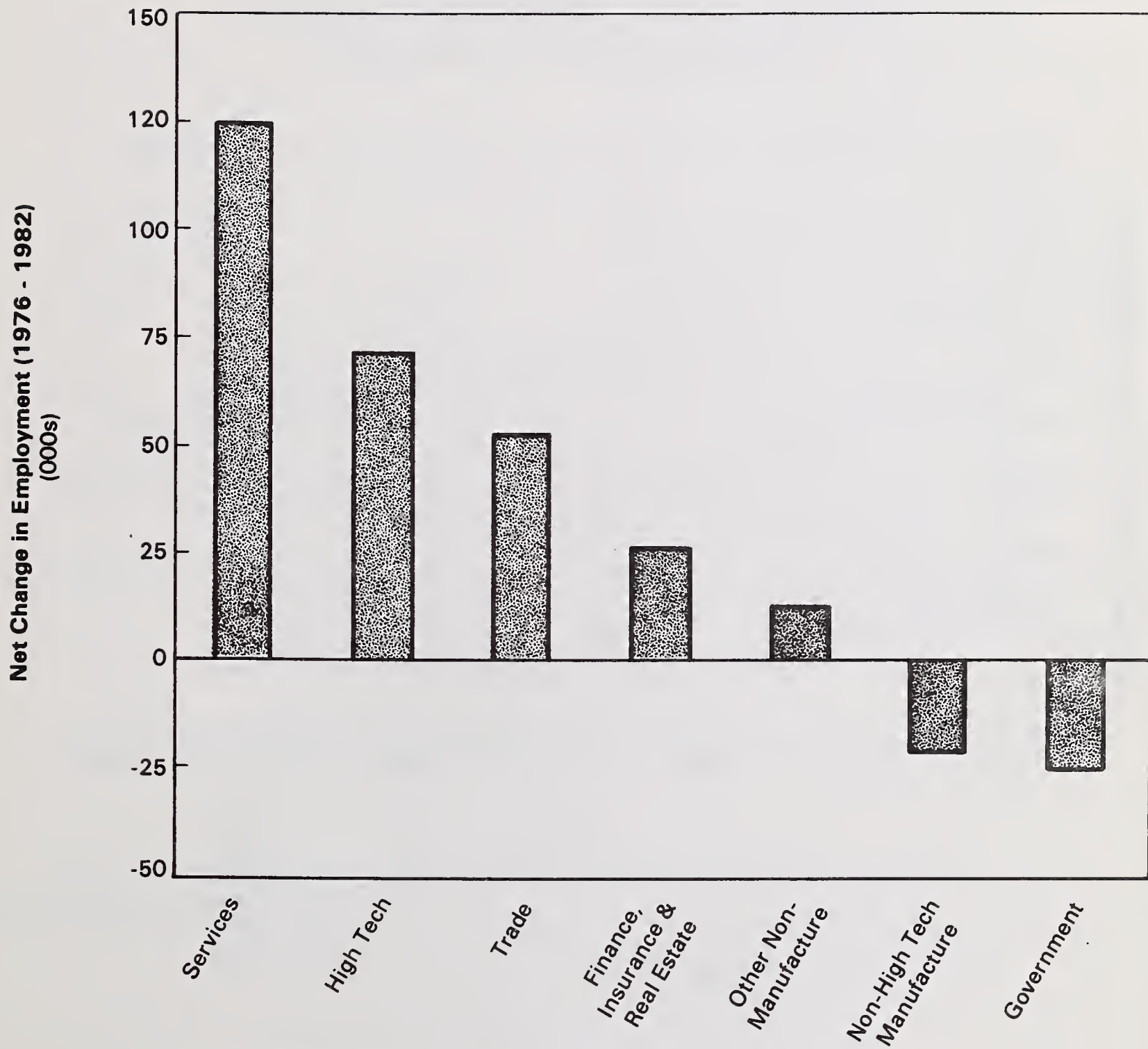
	<u>1950</u>	<u>1965</u>	<u>1974</u>	<u>1982</u>
Construction	4.2%	4.3%	3.8%	3.0%
Manufacturing	40.7%	33.1%	27.2%	24.3%
(Mature Industries)	(34.8%)*	(25.5%)	(19.3%)	(15.1%)
Transportation & Public Utilities	6.7%	5.2%	5.3%	4.6%
Wholesale & Retail Trade	20.1%	20.7%	22.1%	21.9%
Finance, Insurance & Real Estate	4.4%	5.4%	5.8%	6.4%
Services including Mining	12.1%	17.3%	20.8%	25.9%
Government	<u>11.8%</u>	<u>13.8%</u>	<u>15.1%</u>	<u>14.1%</u>
TOTAL	100.0%	100.0%	100.0%	100.0%
Total in Thousands	1,757.1	2,015.8	2,353.7	2,638.0

\* Estimated.

Source: Massachusetts Division of Employment Security: 790 Series

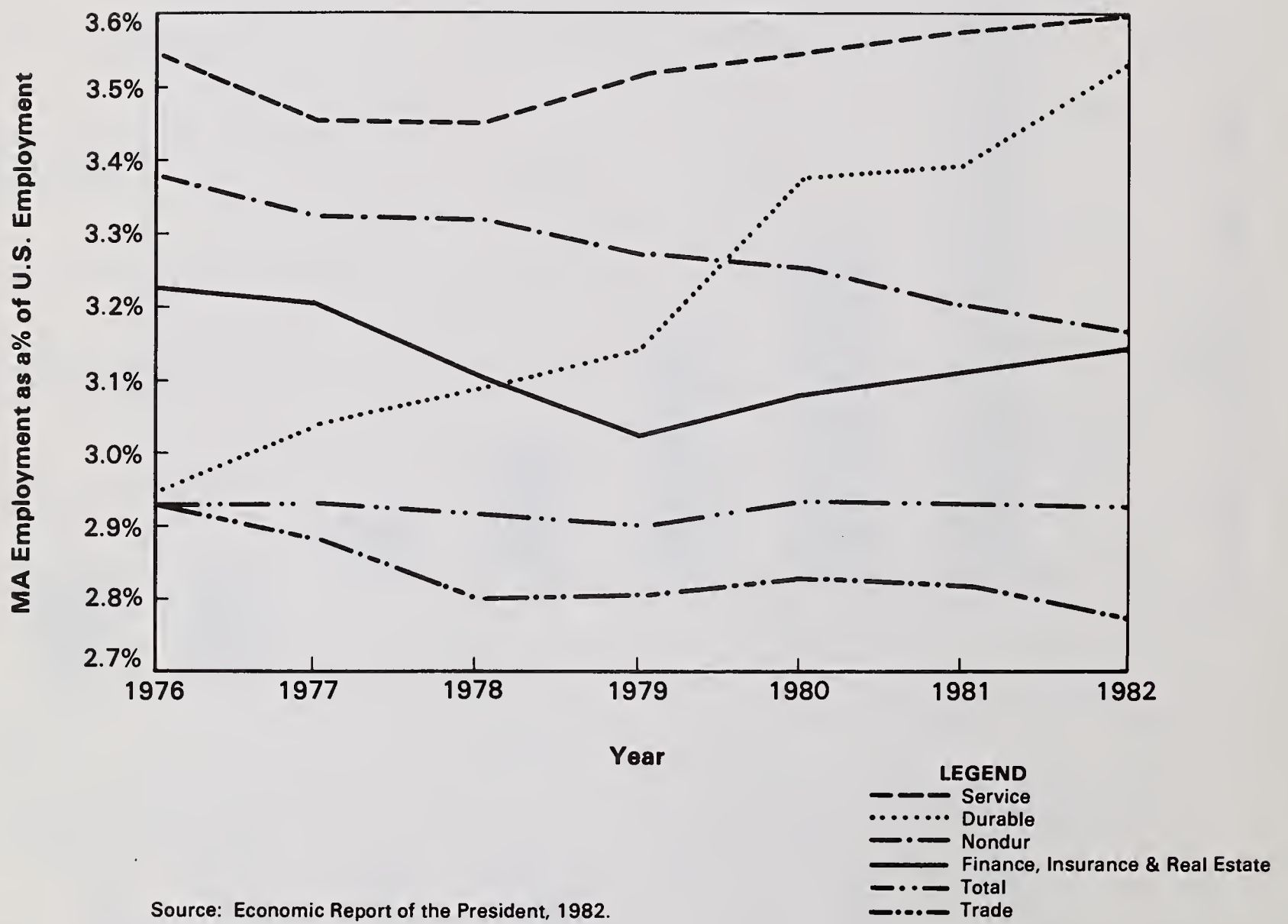


**EXHIBIT 10**  
**Job Growth 1976 - 1982**



Source: Massachusetts Division of Employment Security.

# **EXHIBIT 11** **Massachusetts Share of United States Employment** **for Major Sectors of the Economy**



**EXHIBIT 12**  
**Employment Structure of the United States and Massachusetts**  
**1982**

	<u>UNITED STATES</u>		<u>MASSACHUSETTS</u>	
	<u>THOUSANDS</u>	<u>PERCENT</u>	<u>THOUSANDS</u>	<u>PERCENT</u>
Manufacturing	18,853.0	21.0%	640.0	24.3%
(High Technology)	(3,635.0)	(4.1%)	(242.7)	(9.2%)
Construction	3,911.0	4.4%	78.4	3.0%
Transportation, Communication & Utilities	5,081.0	5.7%	120.1	4.6%
Trade	20,401.0	22.8%	577.0	21.9%
Finance, Insurance & Real Estate	5,340.0	6.0%	168.7	6.4%
Services & Miscellaneous	20,207.0	22.6%	682.2	25.9%
Government	<u>15,803.0</u>	<u>17.6%</u>	<u>370.7</u>	<u>14.1%</u>
TOTAL	89,596.0	100.0%	2,638.0	100.0%

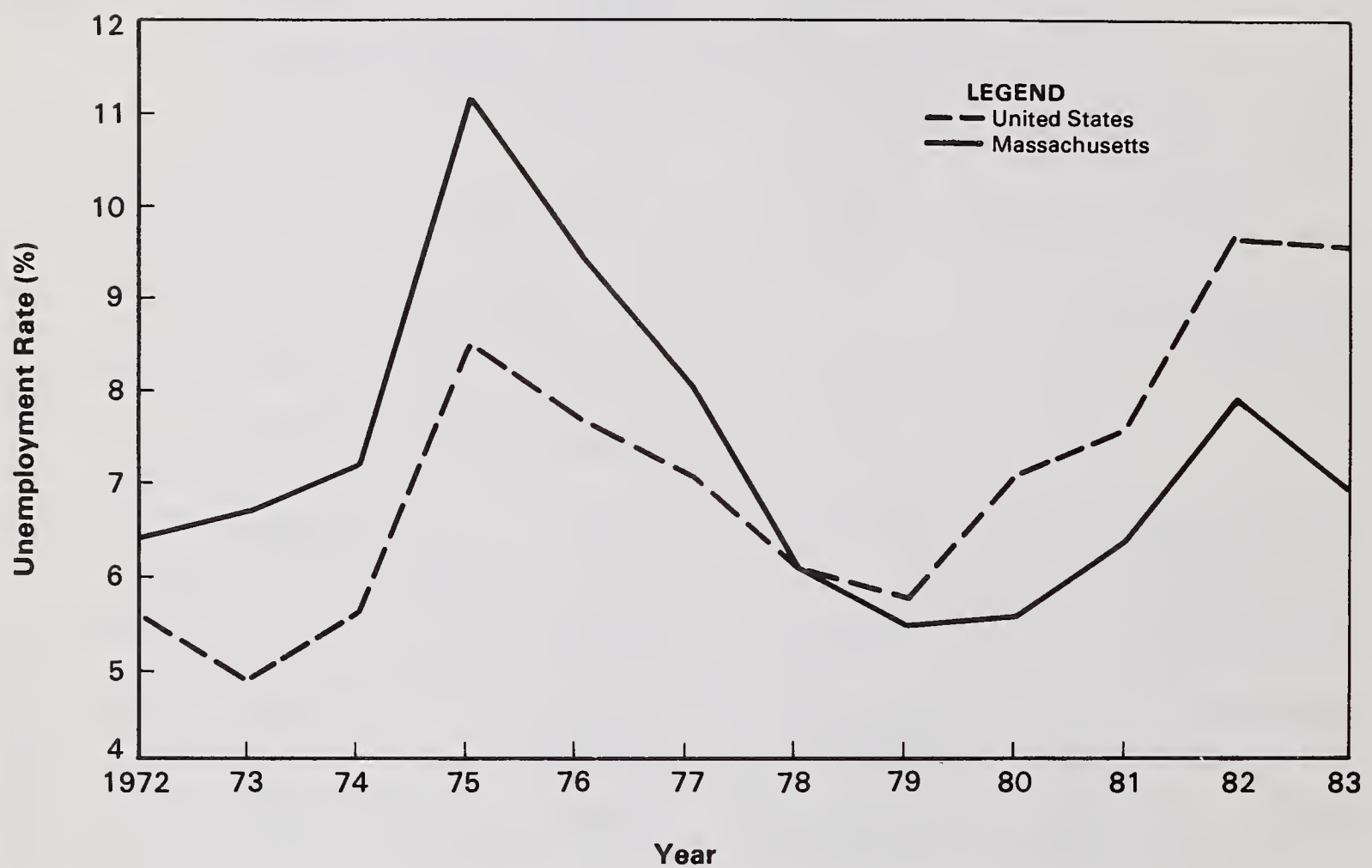
Totals do not sum due to rounding.

Source: Massachusetts Division of Employment Security: 790 Series

United States Bureau of Labor Statistics: "Employment and Earnings"

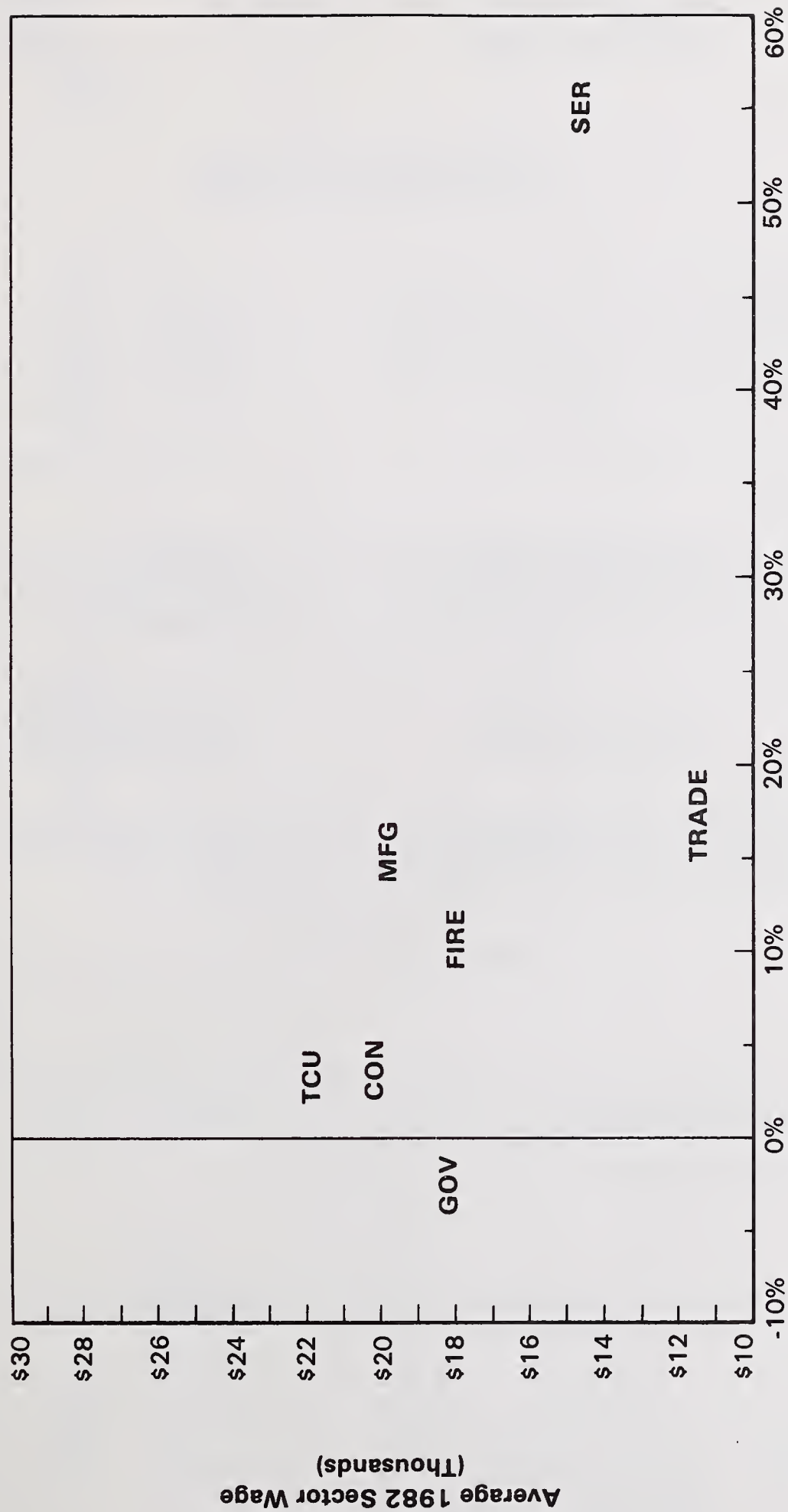


**EXHIBIT 13**  
**Comparative Unemployment Rates**  
**United States and Massachusetts**



Source: Massachusetts Division of Employment Security.

# **EXHIBIT 14** **Job Growth and Average Wages** **1976-1982**



## **LEGEND**

TCU = Transportation, Communications and Utilities  
 Con = Construction  
 MFG = Manufacturing  
 TRA = Wholesale and Retail Trade  
 SER = Services  
 FIRE = Finance, Insurance and Real Estate  
 GOV = Government

Source: Massachusetts Division of Employment Security

**EXHIBIT 15**  
**Computation of Average Massachusetts State Wage**  
**1981 and 1990**

	<u>TOTAL SECTOR WAGE BILL</u> <u>IN CONSTANT 1981 DOLLARS</u>	
	<u>1981</u>	<u>1990</u>
Construction	\$1,467,923,490	\$1,760,397,000
Manufacturing	\$12,092,920,000	\$13,596,426,000
Transportation, Communications & Utilities	\$2,311,414,500	\$2,263,929,200
Wholesale & Retail Trade	\$6,309,868,700	\$6,996,961,300
Finance, Insurance & Real Estate	\$2,721,364,900	\$3,046,309,800
Services*	<u>\$10,915,764,000</u> <u>\$35,819,255,590</u>	<u>\$12,645,941,000</u> <u>\$40,309,964,300</u>
Divided by Labor Force	<u>2,404,600</u>	<u>2,710,900</u>
Average Private Sector Wage**	\$14,896	\$14,870

\* Includes all publicly funded education and health services except Federal Veteran's Administration employment.

\*\* Includes public sector employment noted in services.

Source: Massachusetts Division of Employment Security, Commission Calculations.



**EXHIBIT 15**  
(continued)  
**Base Case 1990 Average Private Sector State Wage Projections,**  
**Reflecting Only Changes in Job Mix: Backup Data**

INDUSTRY	SIC #	EMPLOYMENT		AVERAGE WAGES 1981	WEIGHTED AVERAGE SECTOR WAGES (in constant 1981 \$)	
		1981	1990		1981	1990
General Building Contractors	15	22,150	26,550	\$18,993		
Non Building Contractors	16	8,450	9,700	\$22,218		
Special Trade Contractors	17	48,400	58,600	\$17,758		
CONSTRUCTION		79,000	94,850		\$18,579	\$18,560
Lumber & Wood	24	5,250	5,700	\$12,829		
Furniture & Fixtures	25	7,700	7,800	\$14,467		
Stone, Clay & Glass	32	12,850	13,150	\$19,088		
Primary Metal	33	17,250	18,300	\$18,429		
Fabricated Metal	34	51,450	56,200	\$18,442		
Machinery, except Electrical	35	111,350	131,950	\$20,157		
Electrical Equipment	36	111,400	133,850	\$19,261		
Transportation Equipment	37	33,250	38,250	\$23,491		
Instruments, etcetra	38	61,300	79,050	\$20,922		
Miscellaneous Manufacturing	39	25,700	26,400	\$14,239		
Food & etcetra	20	25,550	26,550	\$16,332		
Textiles	22	23,600	23,100	\$14,849		
Apparel	23	39,650	38,800	\$10,455		
Paper & etcetra	26	27,200	26,900	\$18,642		
Printing & Publishing	27	45,550	46,050	\$16,216		
Chemicals & etcetra	28	18,350	19,950	\$22,109		
Petroleum/Coal	29	1,850	1,900	\$23,097		
Rubber/Plastics	30	29,750	32,500	\$15,127		
Leather	31	20,900	17,350	\$12,251		
MANUFACTURING		669,900	743,750		\$18,055	\$18,281

# **EXHIBIT 15** **(continued)**

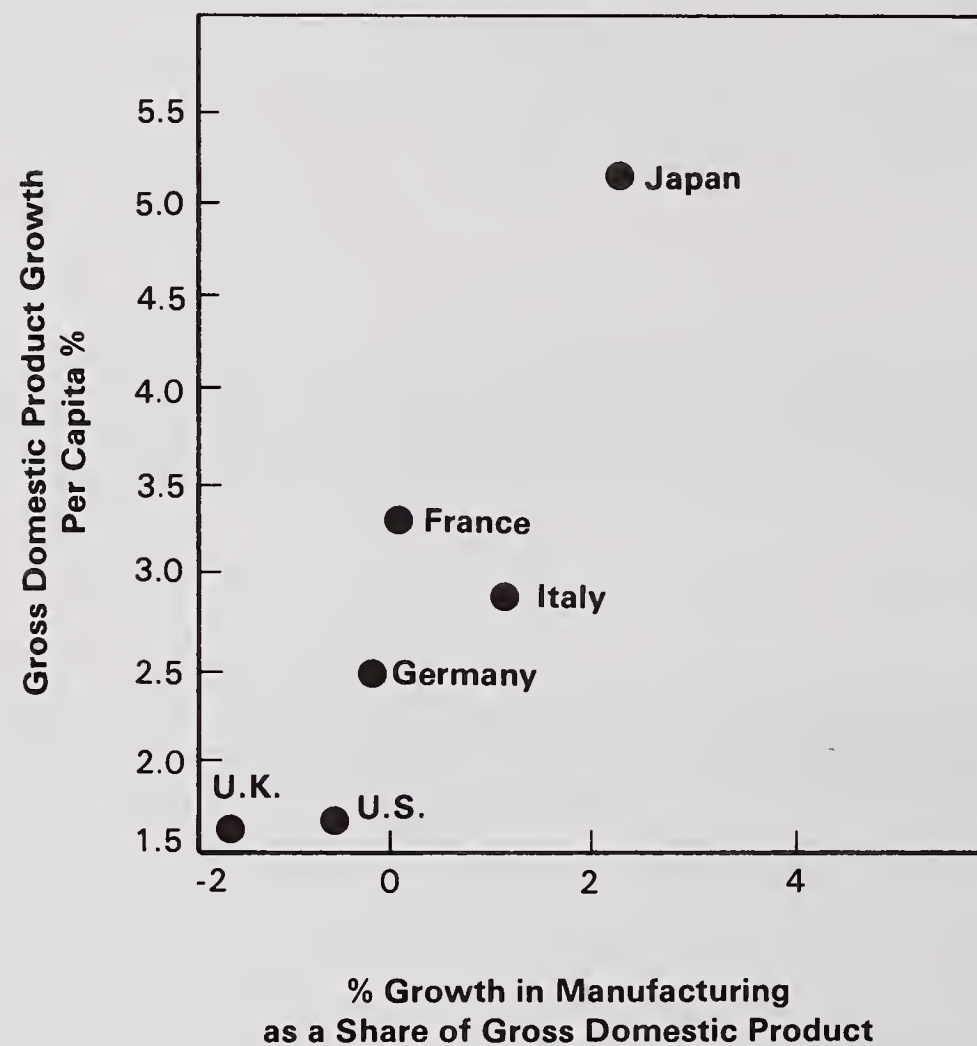
INDUSTRY	SIC #	EMPLOYMENT		AVERAGE WAGES		WEIGHTED AVERAGE SECTOR WAGES (in constant 1981 \$)	
		1981	1990	1981		1981	1990
Transit	41	15,200	14,400	\$ 8,507			
Trucking/Warehouse	42	26,600	26,400	\$19,064			
Water Transport	44	2,600	2,700	\$15,863			
Air Transport	45	9,650	9,250	\$26,099			
Communication	48	38,150	36,250	\$24,368			
Electric, Gas & Sanitary	49	18,550	19,300	\$24,381			
TRANSPORTATION, COMMUNICATIONS & UTILITIES		110,750	108,300		\$20,577		\$20,904
Wholesale Durable	50	71,200	81,950	\$20,206			
Wholesale Non-Durable	51	61,250	65,600	\$18,511			
Building Materials, etcetra	52	13,650	14,500	\$13,518			
General Stores	53	57,800	60,950	\$ 8,603			
Food Stores	54	78,550	80,250	\$ 8,204			
Auto Dealers & Service	55	39,000	40,100	\$13,144			
Apparel, etcetra	56	34,400	36,700	\$ 8,971			
Furniture Stores	57	15,150	16,500	\$11,515			
Restaurants/Bars	58	143,650	183,100	\$ 5,508			
Miscellaneous Retail	59	65,250	72,450	\$ 9,568			
WHOLESALE & RETAIL TRADE		579,900	652,100		\$10,870		\$10,730
Banking	60	50,400	56,150	\$14,283			
Other Credit	61	9,500	10,300	\$12,982			
Security & Commodity	62	9,850	10,800	\$31,048			
Insurance	63	52,450	56,750	\$17,144			
Insurance Agents & Brokers	64	16,550	19,050	\$17,757			
Real Estate	65	22,300	27,250	\$13,749			
Real Estate & Insurance Combined	66	1,150	1,200	\$15,362			
Investment Companies	67	2,750	3,550	\$20,000			
FINANCE, INSURANCE & REAL ESTATE		164,950	185,050		\$16,508		\$16,462

**EXHIBIT 15**  
**(continued)**

INDUSTRY	SIC #	EMPLOYMENT		AVERAGE WAGES		WEIGHTED AVERAGE SECTOR WAGES	
		1981	1990	1981		(in constant 1981 \$)	
						1981	1990
Hotels, etcetra	70	22,700	26,300	\$ 7,569			
Personal Services	72	24,950	25,050	\$ 8,232			
Business Services	73	116,450	149,300	\$14,006			
Auto Repair	75	15,400	16,950	\$12,265			
Miscellaneous Repair	76	7,250	8,000	\$15,905			
Motion Pictures	78	4,100	4,350	\$ 9,467			
Amusement	79	16,400	17,150	\$ 9,203			
Health	80	238,150	296,100	\$13,281			
Legal	81	14,300	17,000	\$18,099			
Educational	82	228,050	231,300	\$14,972			
Social	83	38,300	51,000	\$ 8,453			
Museums/Gardens	84	2,850	3,200	\$ 9,695			
Membership Organizations	86	29,850	30,000	\$ 9,724			
Miscellaneous Services	89	41,350	51,150	\$22,642			
SERVICES		800,100	926,850	\$13,643		\$13,644	

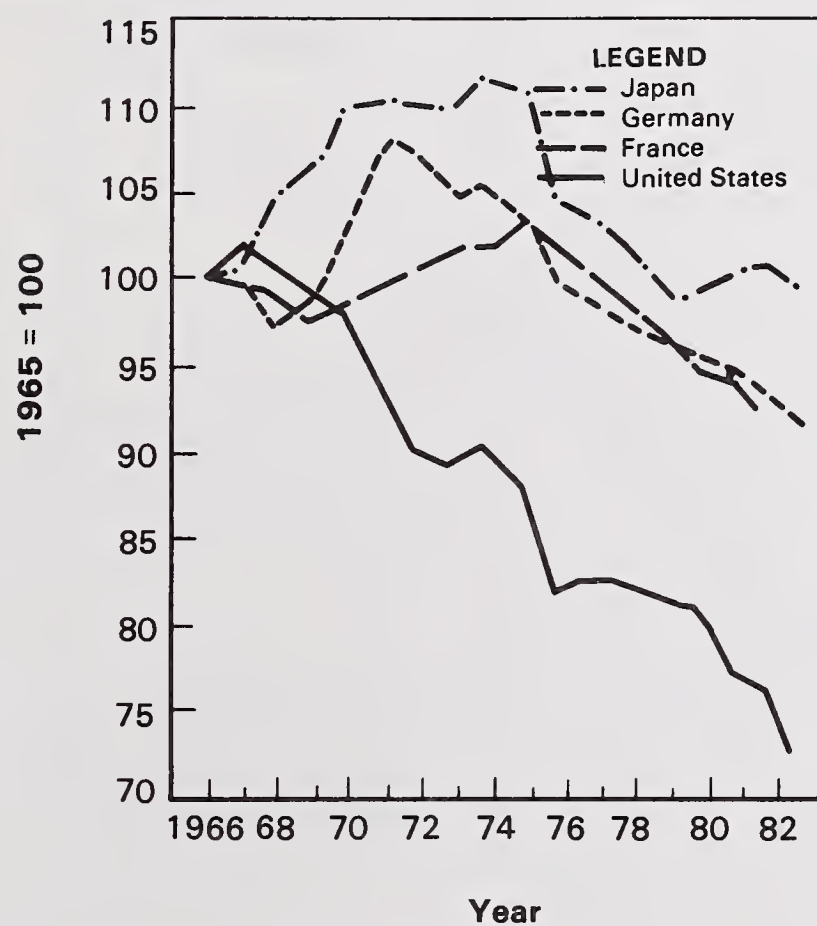


**EXHIBIT 16**  
**Per Capita Growth in Gross Domestic Product and**  
**Growth in Manufacturing Production as a Share of GDP**  
**1965 - 1982**



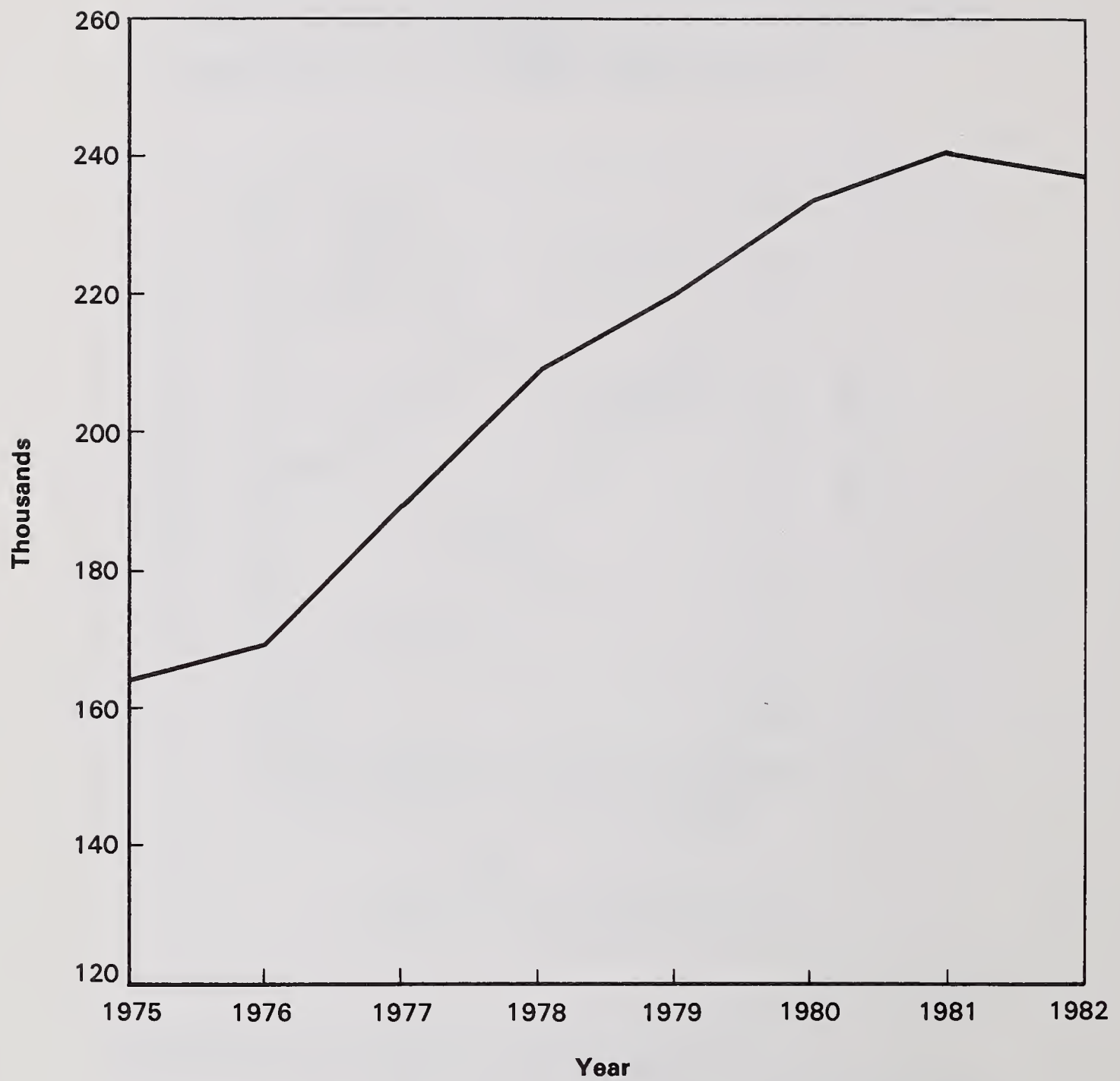
Source: Data Resources, Inc; The DRI Report on U.S. Manufacturing Industries

**EXHIBIT 17**  
**Manufacturing's Share of Total Employment**



Source: Data Resources, Inc; The DRI Report on U.S. Manufacturing Industries

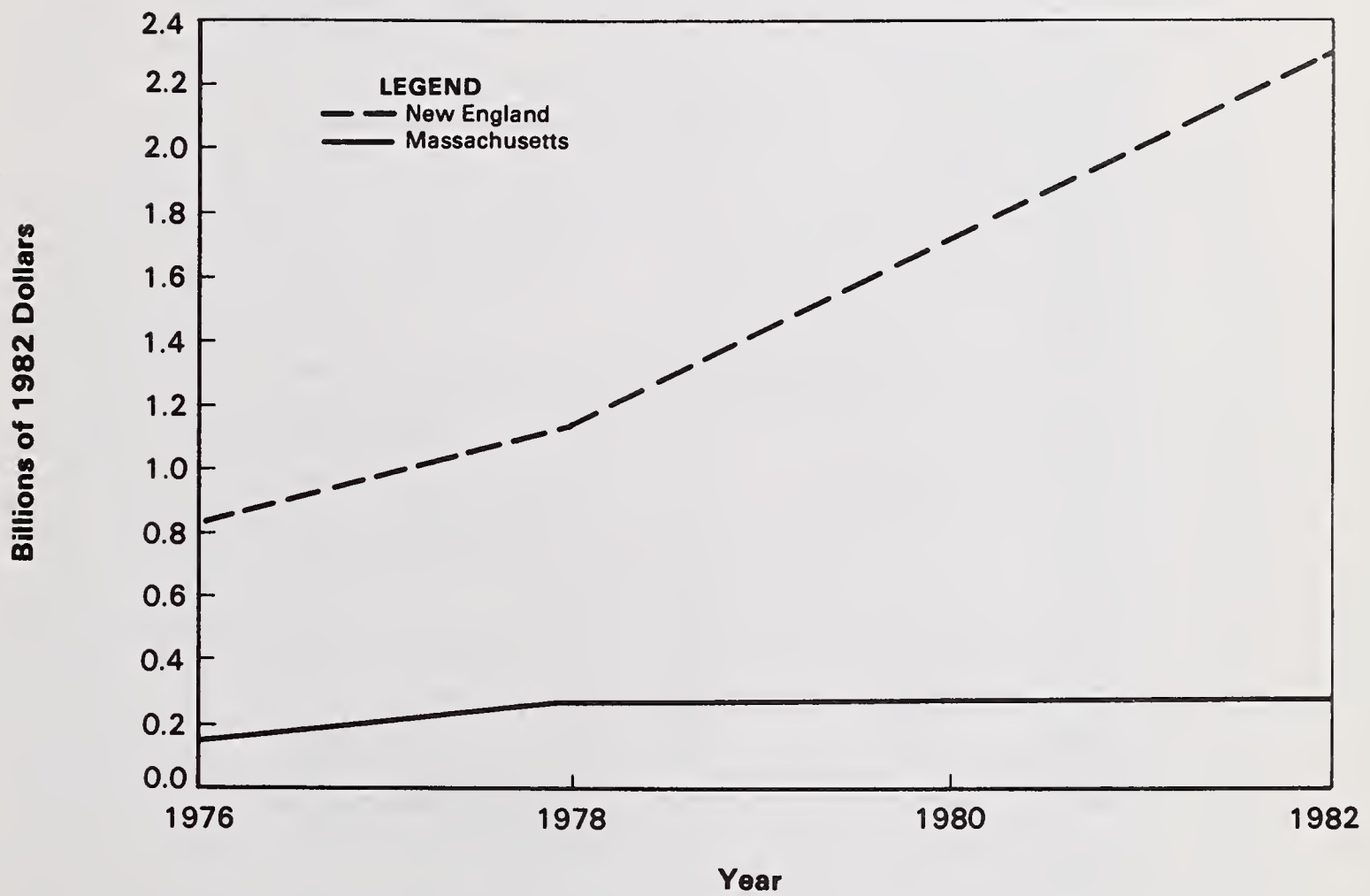
**EXHIBIT 18**  
**Massachusetts Employment in**  
**High Technology Industries**  
**1975-1982**



Source: Massachusetts Division of Employment Security.



# **EXHIBIT 19** **High Tech Related Investment** **1976 - 1982**



Source: Bank of Boston:  
 "Outlook for Capital Spending Among New England Manufacturing Firms"  
 (Various Years)

# **EXHIBIT 20** **Massachusetts Employment Trends by Manufacturing Industry**

<u>SIC</u>	<u>INDUSTRY</u>	<u>1950</u>	<u>1965</u>	<u>1970*</u>	<u>1975*</u>	<u>1980</u>	<u>1983*</u>
<u>INDEX: 1950 = 100</u>							
32	Stone, Clay & Glass	100	107	124	107	128	112
33	Primary Metals	100	91	74	69	77	65
34	Fabricated Metals	100	113	139	127	138	118
35	Machinery except Electrical	100	113	104	111	165	151
36	Electric and Electronic Equipment	100	134	141	125	167	168
37	Transportation Equipment	100	135	146	118	139	138
38	Instruments	100	159	219	244	327	317
20	Food & Kindred Products	100	84	70	58	55	48
22	Textiles	100	33	28	21	22	17
23	Apparel	100	99	84	72	69	62
26	Paper Products	100	111	106	85	86	79
27	Printing & Publishing	100	114	125	110	120	128
28	Chemicals	100	109	127	119	111	99
30	Rubber & Plastics	100	123	109	91	100	98
31	Leather Products	100	67	48	32	30	22
39	Miscellaneous	<u>100</u>	<u>83</u>	<u>81</u>	<u>74</u>	<u>82</u>	<u>64</u>
	TOTAL MANUFACTURING EMPLOYMENT (thousands)	715.7	668.2	648.2	577.8	674.9	624.3

\* Recession Years

Source: Massachusetts Division of Employment Security: 790 Series

**EXHIBIT 21**  
**Massachusetts Industries Gaining Share**  
**Relative to United States**  
**1974 - 1982**

<u>INDUSTRY</u>	<u>% OF STATE EMPLOYMENT (1982)</u>
Optical, Opthalmic and Photo Equipment	1.16%
Special Industry Machinery	.79%
Office, Computing and Accounting Machinery	1.71%
Radio, Television and Communications Equipment	2.07%
Instruments and Supplies	1.03%
Metal Working Machinery and Equipment	.75%
Electronic Components and Equipment	1.27%
Electric Lighting and Wiring	.42%
Engines and Turbines	.24%
Electrical Machinery	.66%
Miscellaneous Electrical Machinery and Equipment	.21%
General Industry Machinery	.49%
Service Industry Machines	.15%
Aircraft and Parts	.35%
Other Transportation Equipment	.31%
Motor Vehicles and Equipment	.17%
Primary Ferrous Metals	.48%
Non-Ferrous Metals	.46%
Plastics and Synthetic Metals	.25%
Household Appliances	.07%
Petroleum Refining	.11%
Miscellaneous Textile Goods	.21%
Miscellaneous Manufacturing	1.15%
Screw Machine Products and Stampings	.42%
Stone and Clay	.55%
Total Percent of Massachusetts Employment	15.48%

Source: Data Resources, Inc.

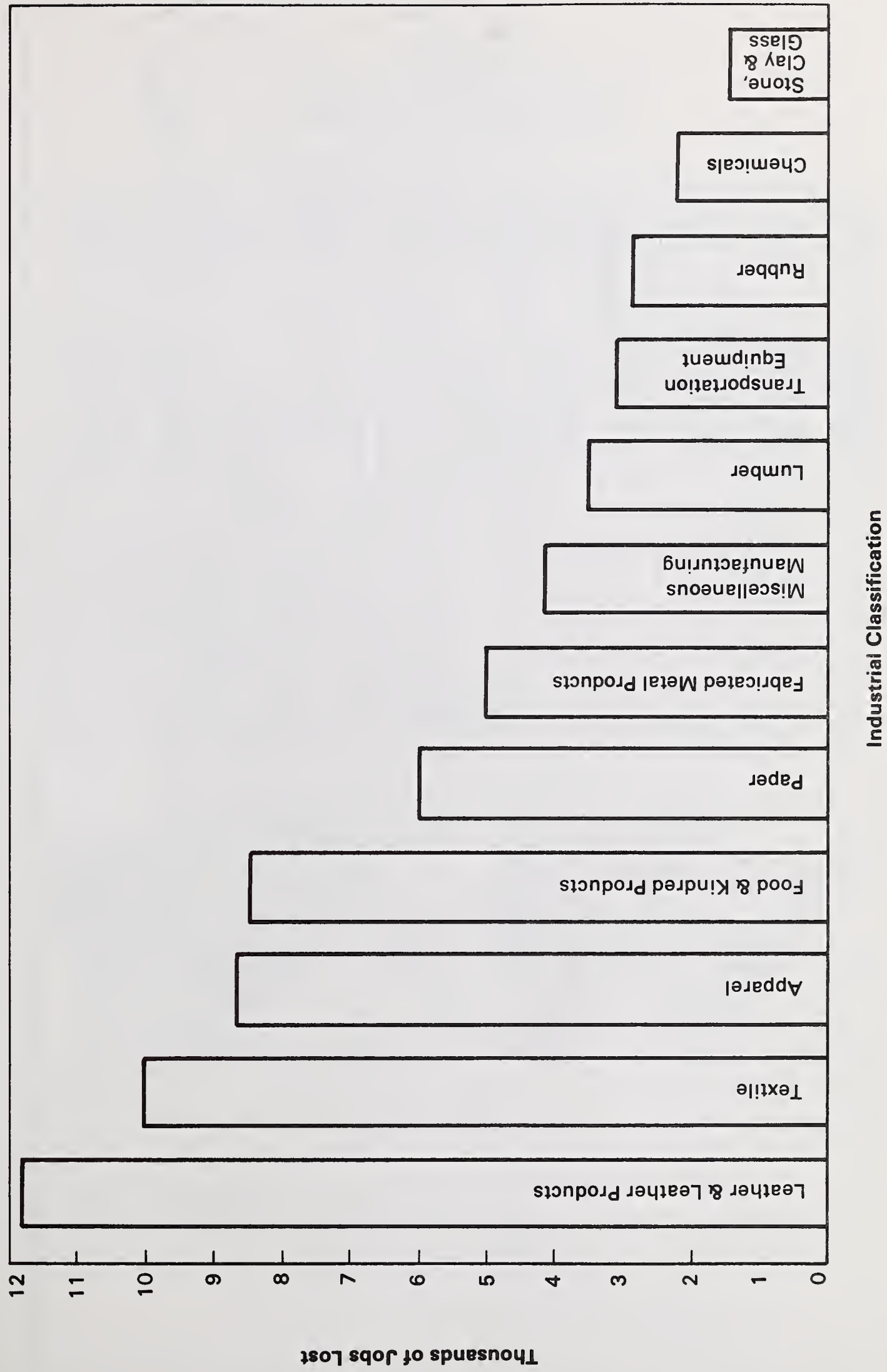


**EXHIBIT 21**  
**(continued)**  
**Massachusetts Industries Losing Share**  
**Relative to United States**  
**1974 - 1982**

<u>INDUSTRY</u>	<u>% OF STATE EMPLOYMENT (1982)</u>
Leather, Tanning and Finishing	.10%
Footwear and Other Leather Products	.73%
 Paper and Allied Products	 .94%
Paperboard Containers and Boxes	.35%
 Lumber and Wood Products	 .23%
Wood Containers	.01%
Household Furnitures	.21%
Other Furniture and Fixtures	.10%
 Apparel	 1.67%
Fabric, Yarn and Thread Mills	.56%
Miscellaneous Fabricated Textile Products	.32%
 Paints and Allied Products	 .06%
Drugs, Cleaning and Toilet Preparations	.28%
Chemicals and Products	.28%
 Fabricated Structural Metal Products	 .36%
Metal Containers	.02%
Other Fabricated Metal Products	.98%
 Food and Kindred Products	 1.17%
 Printing and Publishing	 1.38%
 Rubber and Miscellaneous Plastics	 <u>1.32%</u>
Total Percent of Massachusetts Employment	11.07%

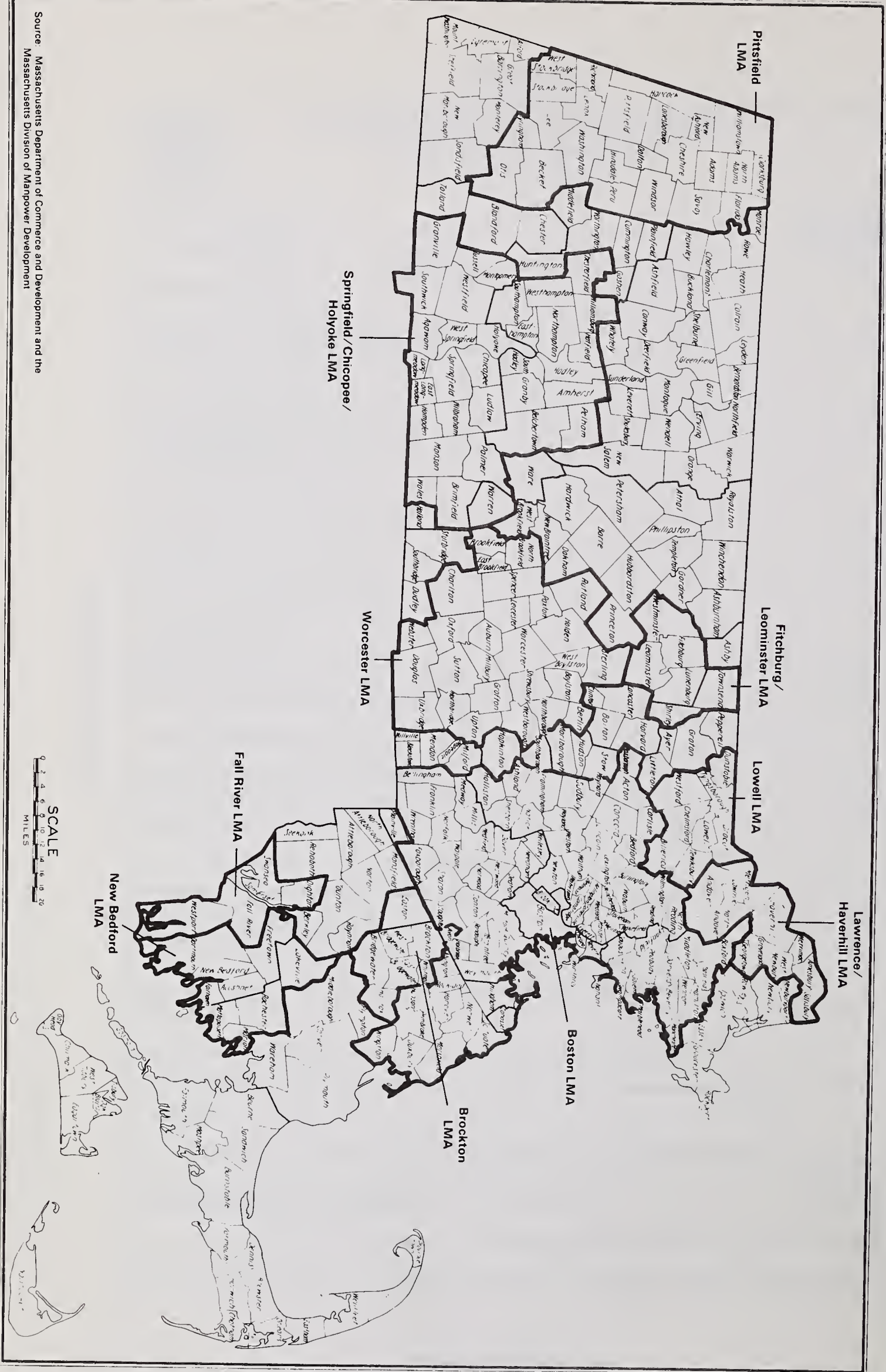
Source: Data Resources, Inc.

**EXHIBIT 22**  
**Manufacturing Job Losses: 1972-1982**



Source: Massachusetts Division of Employment Security.

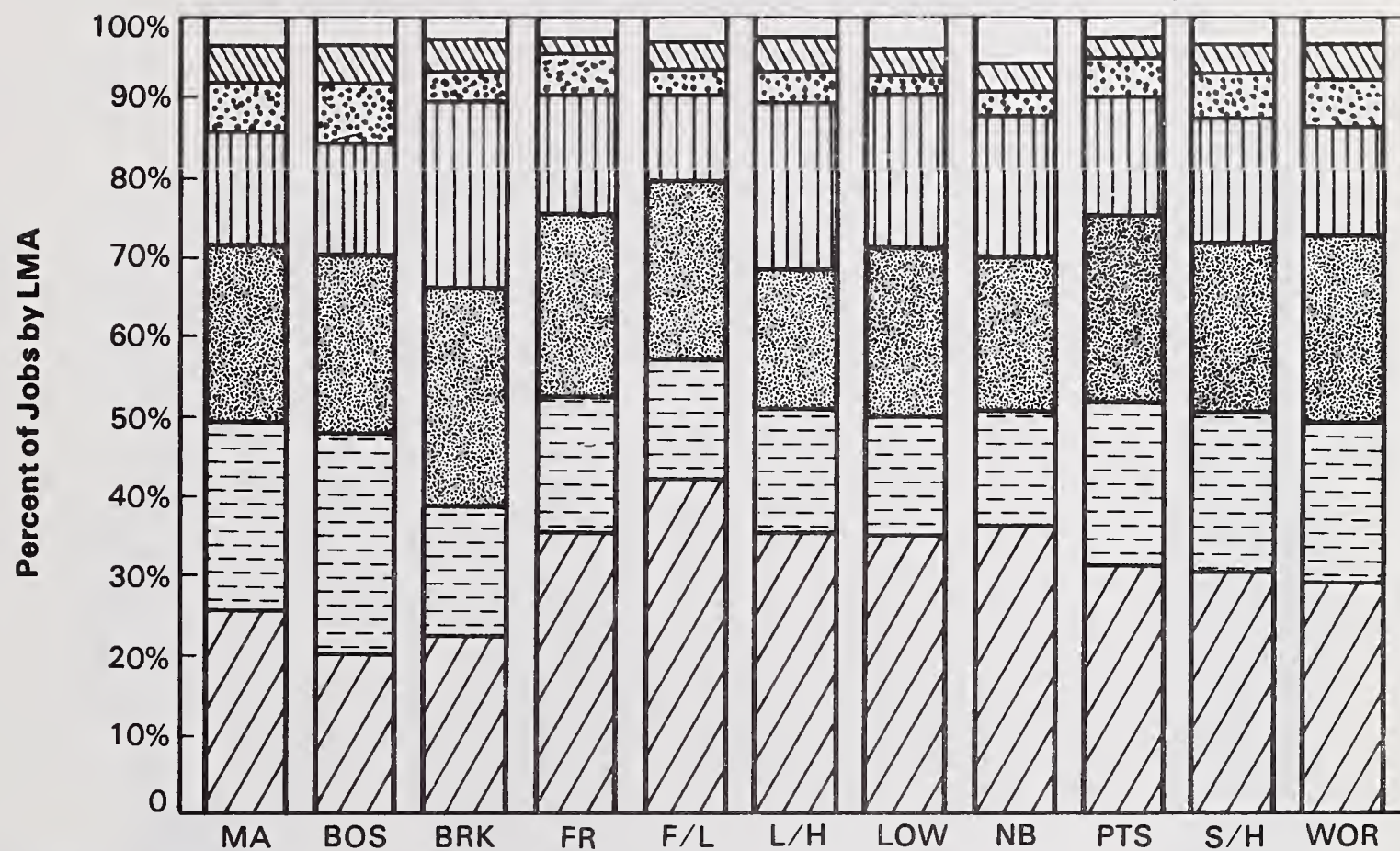
# **EXHIBIT 23** **Map of the State of Massachusetts** **Major Labor Market Areas**



Source: Massachusetts Department of Commerce and Development and the  
 Massachusetts Division of Manpower Development



**EXHIBIT 24**  
**Employment Composition of**  
**Major Labor Market Areas**



**REGIONS**

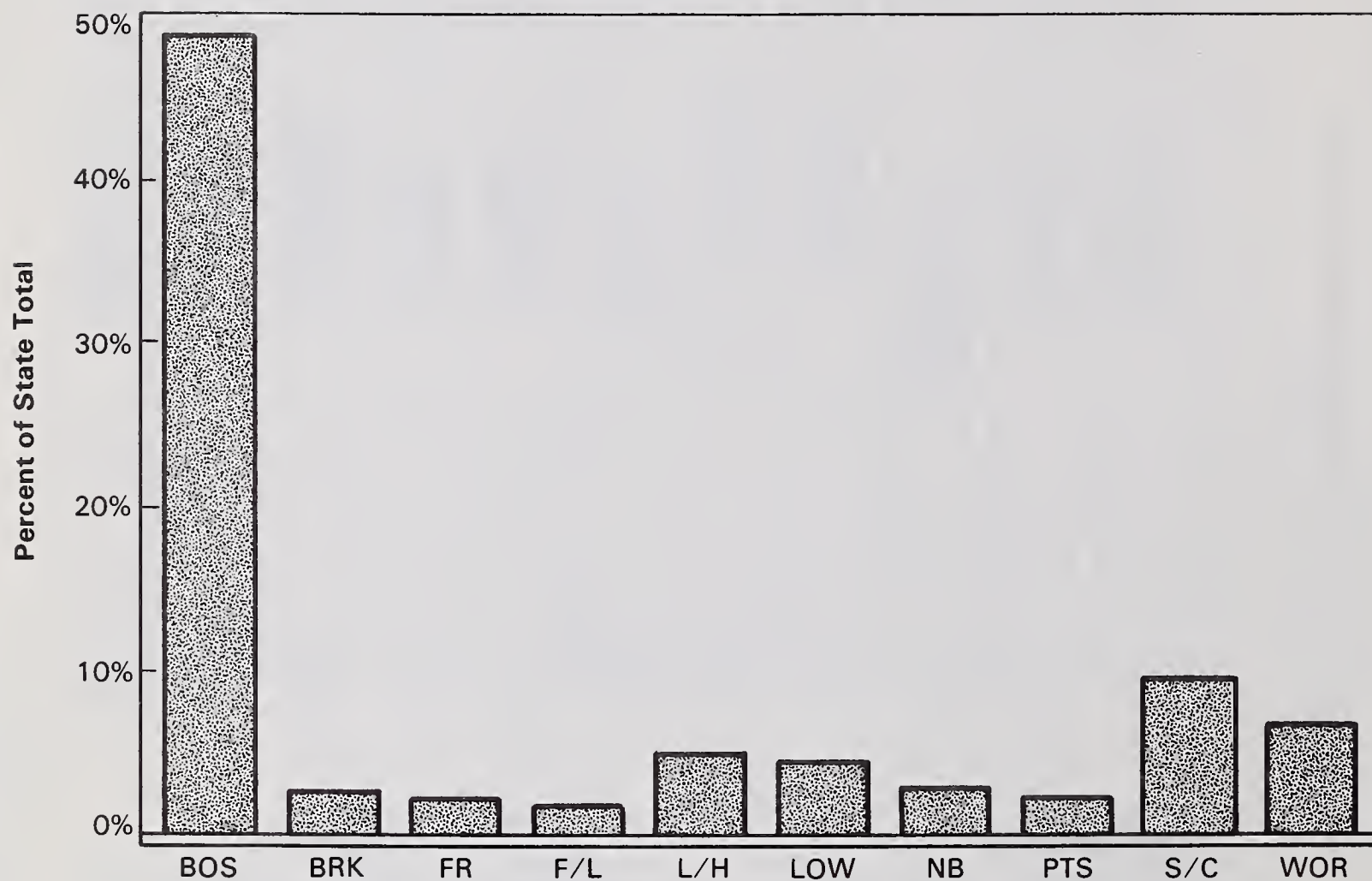
MA =Massachusetts  
 BOS = Boston  
 BRK = Brockton  
 FR = Fall River  
 F/L = Fitchburg/Leominster  
 L/H = Lawrence/Haverhill  
 LOW = Lowell  
 NB = New Bedford  
 PTS = Pittsfield  
 S/H =Springfield/Holyoke  
 WOR = Worcester

**LEGEND**

Manufacturing  
 Service  
 Trade  
 Government  
 Finance, Insurance & Real Estate  
 Transportation, Communication & Utilities

Source: Massachusetts Division of Employment Security, 1981 Figures.

**EXHIBIT 25**  
**Massachusetts Employment by Labor Market Area**

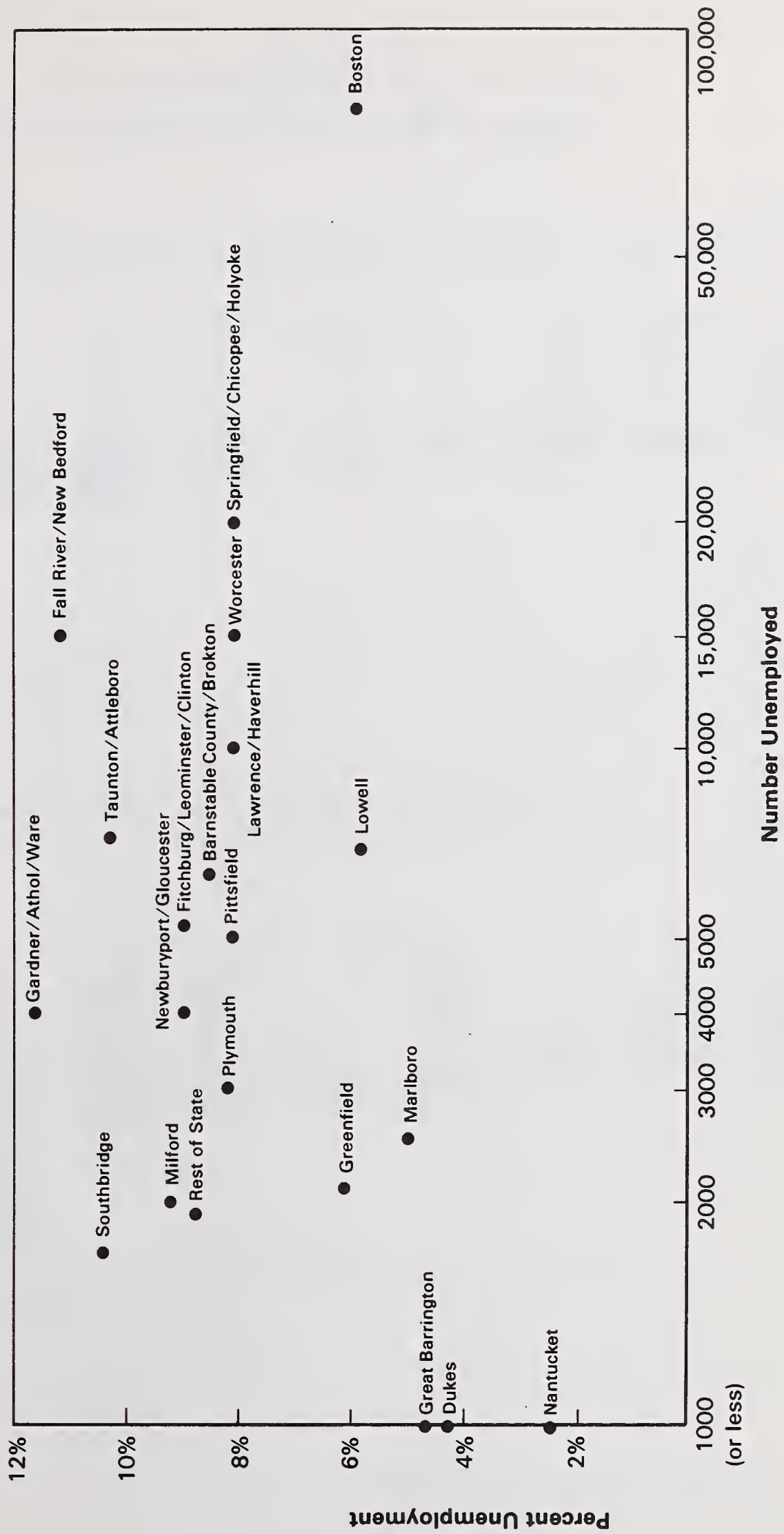


**REGIONS**

BOS = Boston  
 BRK = Brockton  
 FR = Fall River  
 F/L = Fitchburg/Leominster  
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 LOW = Lowell  
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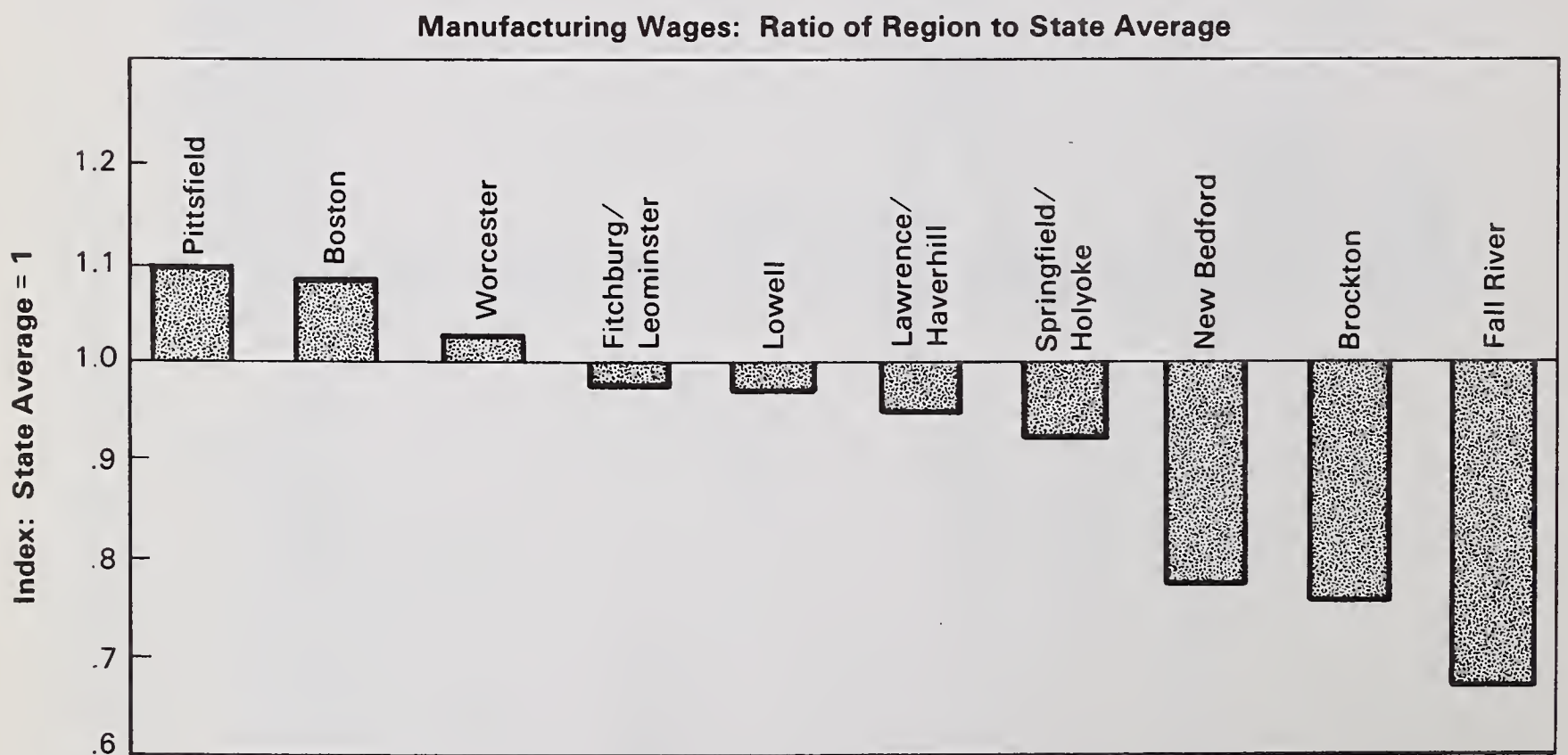
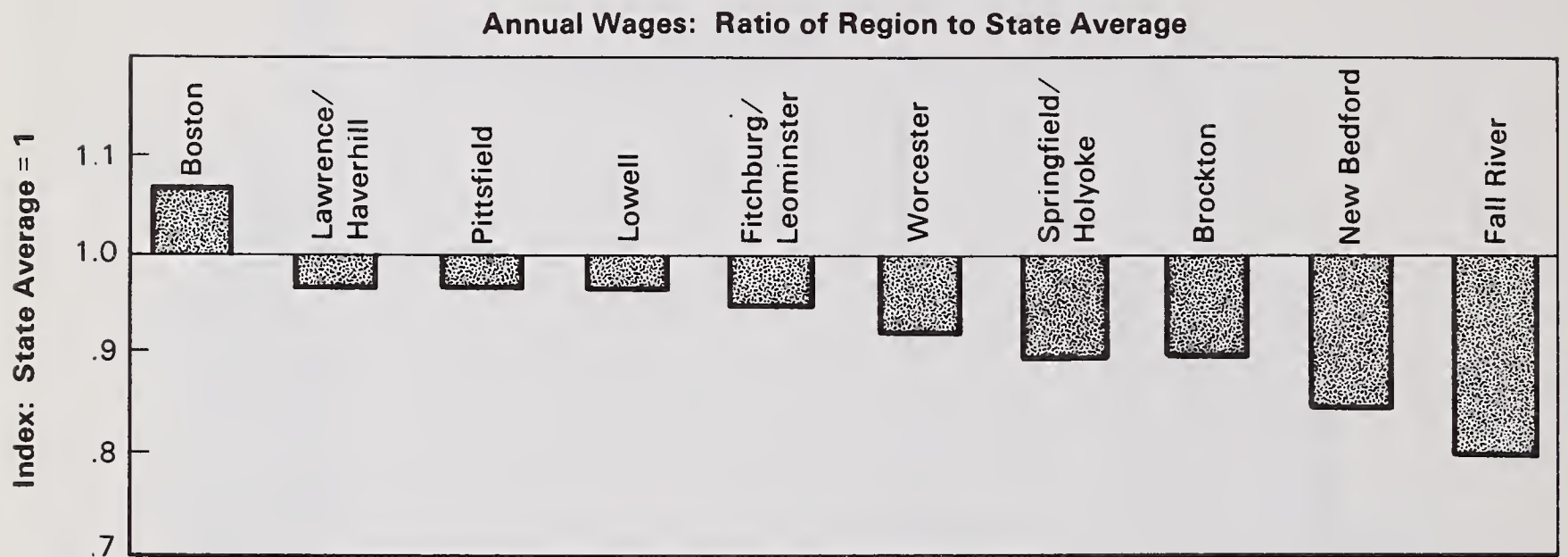
# **EXHIBIT 26** **Unemployment by Labor Market Area**



Source: Massachusetts Division of Employment Security:  
January - September 1983 Average Unemployment Rates



# **EXHIBIT 27** **Average Annual Wages for Labor Market Areas**



Source: Massachusetts Division of Employment Security.

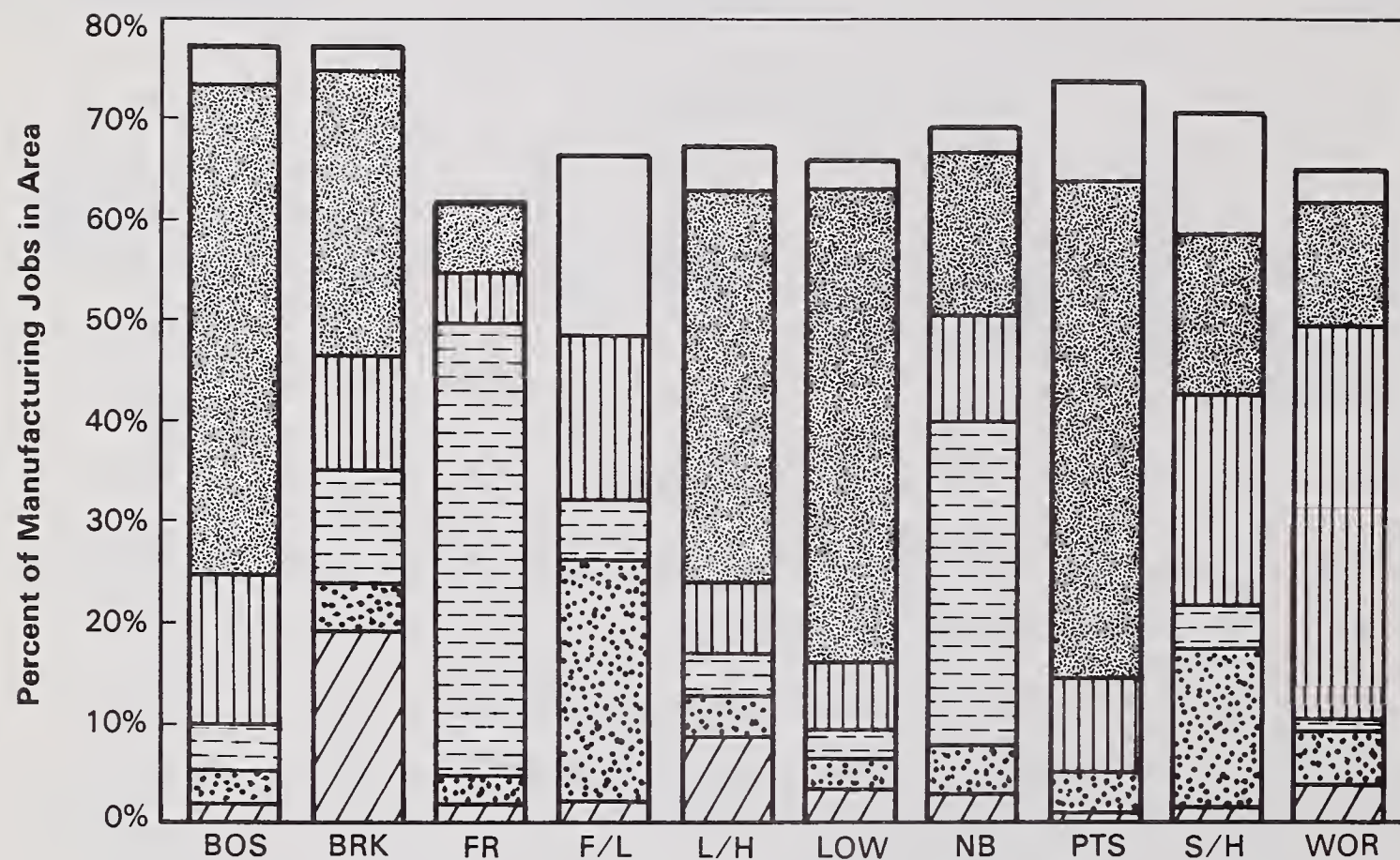
**EXHIBIT 28**  
**Massachusetts Average Wage by Industry**

<u>SIC #</u>	<u>INDUSTRY</u>	<u>1982 AVERAGE WEEKLY EARNINGS</u>
20	Food and Kindred Products	\$303.77
22	Textile	\$259.77
23	Apparel	\$188.04
24 & 25	Wood Products	\$228.38
26	Paper	\$321.63
27	Printing and Publishing	\$298.37
28	Chemicals	\$363.49
30	Rubber and Plastic	\$261.12
31	Leather Products (mainly shoes)	\$189.60
32	Stone, Clay and Glass	\$370.00
33	Primary Metal	\$320.78
34	Fabricated Metal Products	\$318.75
35	Machinery, except Electrical	\$340.35
36	Electrical Equipment	\$295.87
37	Transportation Equipment	\$369.20
38	Instruments	\$337.42

Source: United States Bureau of Labor Statistics, unpublished data for  
Massachusetts



# **EXHIBIT 29** **Regional Employment** **Manufacturing Jobs in Selected Industries**



## **REGIONS**

BOS = Boston  
 BRK = Brockton  
 FR = Fall River  
 F/L = Fitchburg/Leominster  
 L/H = Lawrence/Haverhill  
 LOW = Lowell  
 NB = New Bedford  
 PTS = Pittsfield  
 S/H = Springfield/Holyoke  
 WOR = Worcester

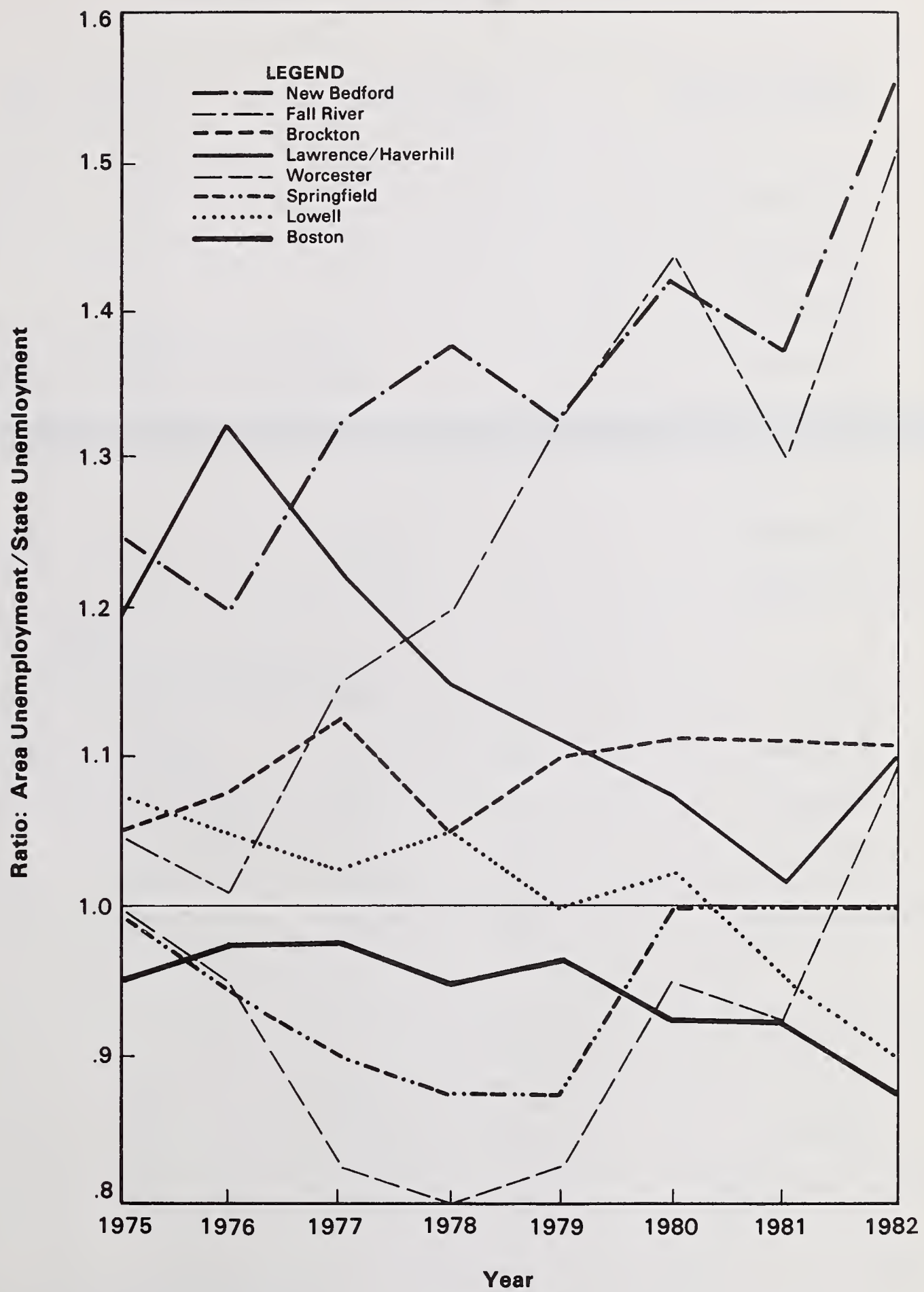
## **LEGEND**

Shoes  
 Rubber & Plastics  
 Apparel  
 Machining Trades  
 HI Tech  
 Paper & Wood Products

Source: Massachusetts Division of Employment Security, 1981 Figures



**EXHIBIT 30**  
**Relative Unemployment Rates: Major Labor Markets**



Source: Massachusetts Division of Employment Security, Commission Calculations. :

**EXHIBIT 31**  
**Business Expansions in Massachusetts**

<u>COUNTY/REGION</u>	<u>1977 - 1978</u>		<u>1981 - 1982</u>	
	<u>#</u>	<u>%</u>	<u>#</u>	<u>%</u>
Berkshire	10	1.7%	25	3.4%
Franklin	5	0.8%	10	1.4%
Hampden	54	9.1%	64	8.8%
Hampshire	<u>6</u>	<u>1.0%</u>	<u>9</u>	<u>1.2%</u>
WESTERN REGION	75	12.6%	108	14.9%
Worcester	<u>87</u>	<u>14.6%</u>	<u>122</u>	<u>16.8%</u>
CENTRAL REGION	87	14.6%	122	16.8%
Essex	89	14.9%	107	14.7%
Middlesex	199	33.3%	208	28.7%
Norfolk	41	6.9%	52	7.2%
Suffolk	<u>21</u>	<u>3.5%</u>	<u>35</u>	<u>4.8%</u>
EASTERN REGION	350	58.6%	402	55.4%
Barnstable	9	1.5%	9	1.2%
Bristol	35	5.9%	39	5.4%
Plymouth	<u>41</u>	<u>6.9%</u>	<u>46</u>	<u>6.3%</u>
SOUTH EAST REGION	85	14.2%	94	13.0%
TOTAL	597		726	

Source: Massachusetts Department of Commerce and Development: Report on Business Expansions in Massachusetts

# INDUSTRY STUDIES

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## APPENDIX B

### REPORT OF THE GOVERNOR'S COMMISSION ON THE FUTURE OF MATURE INDUSTRIES

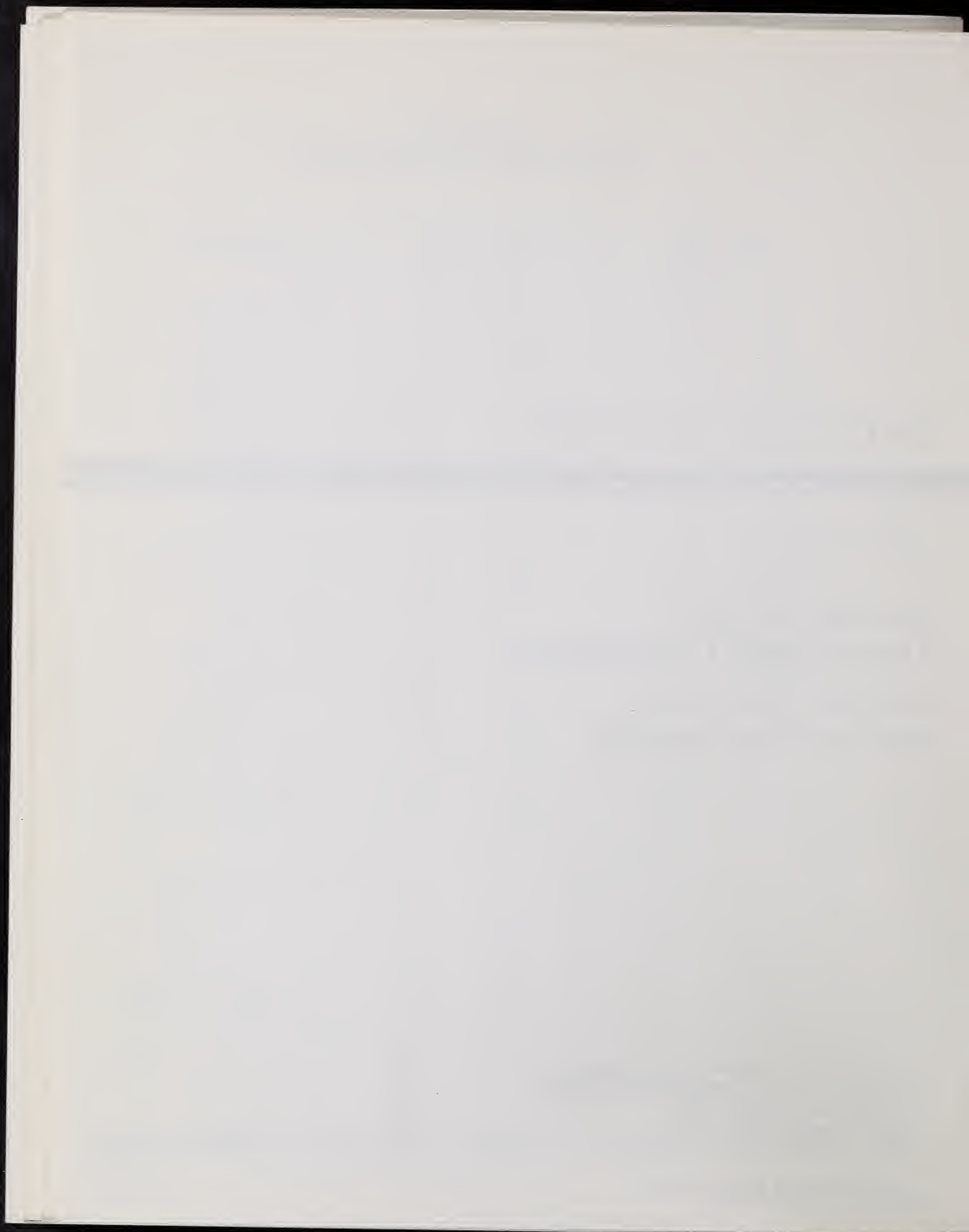
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Michael S. Dukakis  
Governor

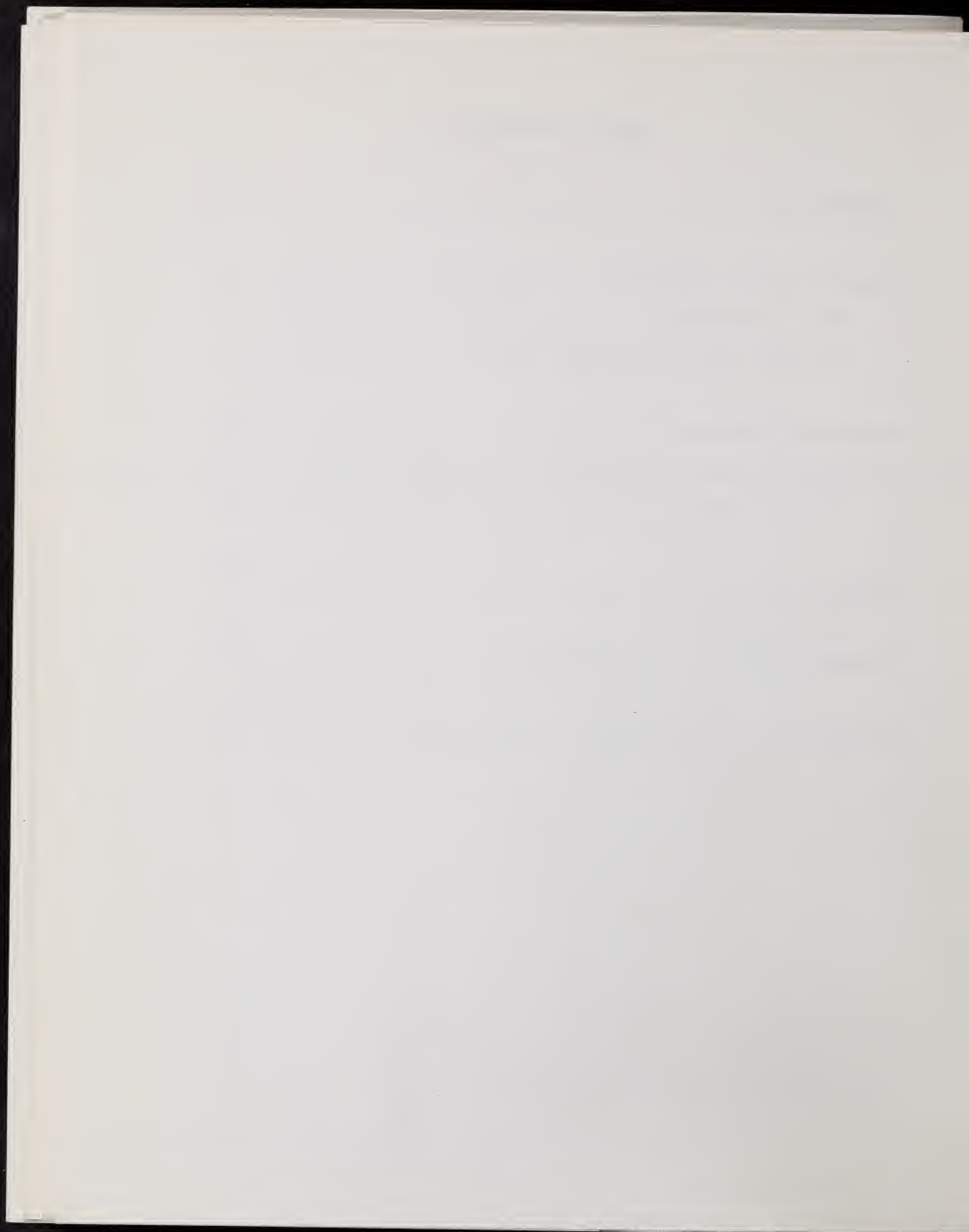
June 1984





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## INTRODUCTION

In order to better understand the composition of and issues facing industries within the Commonwealth, the Commission undertook a series of studies of selected mature industries. In determining which ones to study, the Commission wanted to include industries of importance to various regions of the state, ones which affected particular groups of workers, and ones which were affected by issues common to other traditional manufacturing businesses.

The industries selected for study include:

- Special industry machinery
  - textile machinery
  - printing trades machinery
- Metalworking machinery
  - machine tools
  - cutting tools
- Shoes
- Apparel; and
- Textiles.

Conventional wisdom sometimes associates "mature industries" with a lethargic business environment, but today that is certainly not the case. Traditional manufacturing industries have been affected by several factors which require the same degree of responsiveness and business acumen usually associated with high technology industries. The accompanying studies show that companies which rely on old ways of doing things can no longer remain viable in a changing economic world. Factors which affect mature manufacturing companies cut across industry lines. As shown in the following studies, those factors include:

- Increasing international competition
  - from low-wage countries (shoes, apparel, low-end machine tools)
  - from high-wage countries (textile machinery, high-end machine tools)
- National factors such as the value of the dollar and trade policy (all industries studied)

- The development of new materials which are reducing market size for traditional products (cutting tools, textiles)
- Shifting domestic location of customers or the industry itself (textile machinery, metalworking machinery, textiles)
- The development of new generations of production equipment which affect both the equipment suppliers and their customers (textile machinery, machine tools); and
- Changing industry structure--acquisitions, shifts from manufacturing to importing, and trends towards larger firms (shoes, cutting tools, machine tools).

Each industry in Massachusetts, however, has its own unique story. The shoe industry is the one most affected by imports; the (women's) apparel industry is characterized by a vicious cycle which perpetuates unstable employment; the textile industry is characterized by firms developing niche strategies; the metalworking machinery industry is being affected by business cycles which have weakened its ability to compete with foreign firms that have different industry structures, as well as by new materials; and the special industry machinery industry chronicles the story of the birth of one industry in Massachusetts and the death of another.

As discussed in the Commission's final report and as presented in the accompanying studies, successful companies have been those able to respond to these trends, through a combination of innovation, risktaking, market focus and a willingness to invest in the future of their businesses. In each of the industries studied, the Commission found examples of thriving firms.

Some of the industries discussed will no doubt decline in the future. While good management and a productive, flexible workforce can make a tremendous difference in the success of a business, some obstacles cannot be overcome. The cost advantages of manufacturers in low wage countries make it virtually impossible for U.S. manufacturers to compete head-on. Shifting industry structures mean that some companies will be consolidated into other operations. In other cases, businesses can remain profitable only by reducing the size of their workforces, thereby limiting employment opportunities in traditional manufacturing.

In many cases, individual states are limited to what they can do to help their manufacturing industries. Trade policies, exchange rates, and relative national interest rates are outside their control. There are however, several



things a state can do. The Commission's recommendations for a product development fund, a stabilization fund, changes in the current programs of the Commonwealth's quasi-public financing institutions, and an industrywide assistance capability address some of the issues raised in the accompanying industry studies.

The studies themselves give an overview of each industry, focus on the makeup of that industry in Massachusetts and the special issues the companies face. The sources used include various government and industry publications, and Massachusetts Division of Employment Security statistics. Deborah Gaines and Hank Webber assisted in the preparation of the metalworking machinery industry study. In addition, over 50 interviews were conducted with industry experts and Massachusetts companies. The Commission thanks these people, without whom the industry studies would have been nothing more than a compilation of statistics. For confidentiality reasons, company names are mentioned infrequently in the studies and only when the information is publicly known or has been approved by the company.



## THE SPECIAL INDUSTRY MACHINERY INDUSTRY

### OVERVIEW OF THE INDUSTRY

The special industry machinery (SIM) industry is composed of companies manufacturing production equipment unique to special industries. Looms for the textile industry, lasting equipment for the shoe industry, pulpers for the paper industry, and processing equipment for the food industry are examples of SIM.

Massachusetts has historically excelled in the design and manufacture of specialized machinery for industries dominant in the state. During the 19th century, the growing shoe, apparel, and textile industries in New England provided a strong market for the machinery needed for the production of these goods.

Although not as strong as it once was, Massachusetts still has significant employment in the SIM industry. Even after recent declines, in 1983 there were approximately 13,000 jobs in the state in textile machinery, paper machinery, food processing machinery, printing trades machinery, and other specialized equipment.

Both nationally and in Massachusetts, employment in the SIM industry is at its lowest point in over 15 years (Exhibits 1 & 2). This is partially due to the severity of the recent recession. Demand for machinery is very sensitive to cyclical trends. Periods of declining demand and subsequent low capacity utilization generally lead to large cutbacks in new equipment investments. In addition, demand is sensitive to interest rates. The high financing costs of recent years have further depressed sales.

Other than its cyclical nature, it is difficult to generalize about trends affecting the industry. Each machinery category is very sensitive to specific conditions in its own end-use market. The transfer overseas of much of the apparel and shoe industries has reduced the size of the domestic market for their specialty production equipment. On the other hand, the information revolution has led to increased demand for highly technical printing machinery. For example, while the balance of trade in printing machinery was growing throughout the 1970s, increased imports and declining exports significantly eroded the balance of trade in textile machinery (Exhibit 3).

The success of U.S. producers of SIM will increasingly be tied to their ability to adjust to changes in end-use markets and remain technologically competitive with foreign manufacturers.



Employment in Massachusetts in the SIM industry has changed dramatically since the mid 1960s. Many trends are apparent during this period:

- Employment in Massachusetts exhibits the same general cyclical trends as in the U.S. (Exhibit 1).
- The downturn of the late 1960s disproportionately affected this state (Exhibit 2). In fact, Massachusetts never really recovered from this severe downturn. After 1973, Massachusetts employment never reached more than 85% of the 1967 employment level. In contrast, U.S. employment exceeded 1967 levels in three years. By the end of 1983, employment in Massachusetts was only 63% of 1967 levels, a loss of about 8,000 jobs.
- Massachusetts' share of U.S. employment in the SIM industry was about 10% in 1967. By 1983, the Commonwealth's share of U.S. employment had declined to 8%.

Within the Massachusetts SIM industry, the mix of segments has shifted significantly since the mid 1960s. In 1965, 3% of Massachusetts employment in the industry was in printing trades machinery; in 1981 it was 35%. Textile machinery represented 46% of Massachusetts employment in this industry in 1965; in 1981, it had fallen to 11%. Other segments remained proportionately the same over this period (Exhibit 4).

These shifts are unique to Massachusetts. In the U.S. the proportion of employment in the different segments changed much less dramatically over this period. Printing machinery increased from 13% to 15% of SIM industry employment and textile machinery decreased from 21% to 13% (Exhibit 4).

These shifts reflect a significant loss of employment share in Massachusetts in textile machinery and a significant gain in employment in printing trades machinery. In 1965, 24% of U.S. textile machinery employment was in Massachusetts; by 1981, only 7%. The opposite trend is true in printing machinery. In 1965 only 2.4% of national employment in printing machinery was in Massachusetts. By 1981, it had grown to over 19% (Exhibit 5).

Although the U.S. had a net employment gain of 9% in the SIM industry between 1965 and 1981, Massachusetts had a 17% decline during this same period. The national increase in employment in food products machinery and miscellaneous specialty machinery was not shared in Massachusetts. The



state also saw greater employment declines in textile machinery and paper industry machinery. Only in printing trades machinery did Massachusetts perform better than the U.S. as a whole during this period (Exhibit 6).

Understanding what accounted for the loss of approximately 8,000 jobs in Massachusetts in the textile machinery industry over a 15 year period and the creation of about 6,000 jobs in printing trades machinery during this same period, requires a more focused look at these two industry segments. The following sections examine these two segments in more detail, considering changing market forces, technological advances, and international competition. In essence, this is the story of the death of one industry in Massachusetts and the birth of another.

## THE TEXTILE MACHINERY SEGMENT

### The International Context

The performance of the U.S. in textile machinery has been dismal, both world-wide and domestically. The world market has been in decline for approximately five years. A recent survey by the International Textile Machinery Association found significant declines in shipments of all types of textile machinery. In this depressed world market, U.S. manufacturers have been losing share. In 1960, U.S. share of the world textile machinery industry was 16%; by 1979 it had declined to only 7%.

As the textile industry grew in developing countries, U.S. textile machinery manufacturers did not go after these new foreign markets. In contrast, Western European manufacturers aggressively pursued world markets, exporting at least 75% of their domestic production. U.S. exports have ranged between 20% and 30%, with Canada the major export market. By 1983, the value of U.S. exports in constant dollars was at its lowest point in 25 years.

Domestically, the textile machinery market has also been in decline. In part this is due to more and more end-use products, especially apparel, being produced abroad. Not only has the U.S. market been declining, but domestic manufacturers have been losing share to imports. In 1967 imported textile machinery accounted for 19% of purchases by domestic firms. By 1981 imports had grown to 42%. Exhibit 7 summarizes U.S. import and export trends.

These imports have not come from low-wage countries. Western Europe and, increasingly, Japan are the world leaders. In 1983 West Germany was the source of 36% of the imports, Switzerland 26%, Japan 15%, Italy 6%, and France and the United Kingdom 4% each. Their major competitive edge is



not based on cost, but on the technical sophistication and resulting productivity and quality of output of the machinery.

The failure of U.S. manufacturers to maintain international and domestic market share has been a major cause of the 34% decline in domestic employment between 1965 and 1981. The value of shipments in constant dollars dropped 45% between 1972 and 1983 alone. In recent years the strong value of the dollar has contributed greatly to U.S. manufacturers' difficulty in exporting or competing successfully with imports for the domestic market. However, the primary cause of these trends lies elsewhere.

#### The Lack Of Technological Innovation

Since the 1970s there has been more innovation in the textile machinery than in the prior 100 years. Most of these innovations came from outside the U.S. Japanese and European air jet, water jet, projectile, and rapier looms (all with built-in microprocessors), and ringless spinning machinery are examples of new production equipment which offered product quality and reliability superior to anything American manufacturers could offer. While U.S. manufacturers had been making marginal improvements to traditional product lines, Japanese and European manufacturers were developing new generations of equipment reflecting new technologies in which they had been willing to invest. As one Massachusetts executive noted, "The invention of the water jet loom by the Japanese shook the (domestic) industry to its foundations".

The cautious nature of U.S. manufacturers has long, historic roots. An article in the May 1944 issue of Fortune Magazine chastised the domestic industry for its disinterest in developing new equipment. This article argued that U.S. companies were more interested in the lucrative repair, parts, accessories businesses than in developing innovative new machinery.

From a narrow point of view, which ignores the possibility of competition from abroad, this strategy made some sense. Textile machinery lasts for decades. (Some mills still use looms built in the early 1900s.) Growth in the sales of equipment was, therefore, a function of growth in the textile market, since replacement demand was assumed to be next to nothing. Ancillary businesses such as repair and accessories had the potential to be much larger since they were a function of the large installed base of equipment.

In addition, developing and testing a new production technology is exceedingly costly and risky. The demand for new equipment was considered too low to justify the investment. Developing an export market was outside the



thinking of most companies. Instead of investing in research and development, companies relied on their sales forces and customers for product improvement ideas. Depending on the mills for suggestions, textile machinery firms "allowed product designs to move forward by slow stages and not by revolutionary leaps", according to Thomas Navin in the History of Whitin Machine Works. As a result, by 1983 only 25% of the 600 U.S. textile machinery establishments produced original equipment, the majority supplying parts and accessories. In addition, over 90% of exports were spare parts and accessories, not new machinery.

A Frost and Sullivan study of the international textile machinery industry suggested that the U.S. has not maintained technological parity with Western European manufacturers partially because of the ownership structure of the U.S. industry. Western European companies are privately owned and for the most part, manufacture only textile machinery. In contrast, many of the privately-held U.S. companies were purchased during the 1960s by large conglomerates manufacturing a wide range of goods. In Massachusetts, for example, Whitin Machine Works was acquired by White Consolidated Industries, and Draper Looms was acquired by Rockwell International; while Crompton & Knowles diversified into a number of different areas and concentrated on the more profitable chemical industry.

A 1980 study of U.S. textile machinery manufacturers supported by the United States Department of Commerce concluded that conglomerate mergers had a negative impact on the industry. As a result of these mergers, textile machinery businesses in the U.S. became smaller parts of larger organizations and had to compete with other divisions for funds. In some cases, rather than having access to larger pools of investment capital, the reverse occurred. According to some individuals familiar with Draper Looms, Rockwell disbanded Draper's research and development department and at one point brought in aeronautical engineers with no familiarity with textile machinery equipment. Evidence suggests that the investments and interests of the parent corporations of the textile machinery companies were often directed toward their more glamorous subsidiaries.

There are, of course, notable exceptions to this pattern of disinvestment and technological stagnation. For example, the U.S. is very strong in yarn and warp preparation equipment and textile finishing machinery. A few U.S. manufacturers continue to play a crucial role in the development of textile machinery and invest significantly in research and development.



### Implications of Industry Structure

The U.S. textile machinery segment is very fragmented. That is, companies tend to concentrate on particular types of equipment. One company may make yarn preparation machinery, another looms and still another finishing equipment. The number of domestic manufacturers of particular types of equipment for specific types of yarns or fabrics is low. This has the tendency to minimize the importance of research and development, since companies have less of a need to differentiate their particular product lines.

The fragmented structure of the industry has had another important consequence, particularly in recent years. As third world countries build up their textile industries, they constitute important markets for new textile machinery. These buyers frequently want to purchase "turn-key plants" where the equipment manufacturer supplies all the machinery necessary to begin production, so all the buyer has to do is "turn the key" to the new factory door.

Many European companies are able to supply a wide range of equipment, either individually or in conjunction with other machinery manufacturers. In some cases, companies receive government assistance to package a turn-key facility. Other foreign companies have developed joint marketing ventures. For example, a group of Italian textile machinery manufacturers have organized Texma-Piata, a consortium which markets their products around the world.

Some attempts have been made by U.S. firms to market a complete line of equipment. In the 1970s, Davis & Furber, Warner & Swasy and Saco-Lowell tried to put together and market an all-American line. According to one participant in this project, the industry was too fragmented and competition too great for such a cooperative effort. More recently a number of companies working together were able to sell 45 complete lines to the Soviet Union.

As more and more companies have been faced with survival, the ability to market an entire line has taken on new importance. Through mergers and acquisitions, a few American companies are now trying to develop the capability to supply an entire mill. In 1983, for the first time in years, one U.S. company has been able to do this.

### Textile Machinery In Massachusetts

A 19th century map of U.S. textile machinery firms consists almost entirely of New England companies. Whitin Machine Works, the Saco-Lowell Shops, Draper Looms, Crompton & Knowles and Davis & Furber--all Massachusetts companies--were among those which dominated the production of textile machinery for over 100 years. These companies were the



source of many of the major innovations in machinery technology in the 1800s. William Crompton invented the first successful power loom for weaving fancy fabric in 1837 and George Draper invented the first fully automatic loom. When the American Textile Machinery Association (ATMA) was formed in 1933, 38 of the 97 members were headquartered in Massachusetts. Until 1970, with few exceptions, the presidents of the ATMA were from Massachusetts.

Since 1970 the Massachusetts textile machinery industry has been devastated. Today, none of the five former industry leaders mentioned earlier manufactures equipment in Massachusetts. The industry has been hit by all the forces that affected the U.S. industry in general. It has been further eroded by the movement of remaining firms to the South. This state's share of U.S. employment in textile machinery declined from 24% in 1965 to 7% in 1981. Currently, North Carolina and South Carolina are the center of U.S. production of textile machinery.

As discussed earlier, many of the companies in Massachusetts were either bought out by larger corporations or diversified into new product areas. As the textile industry itself moved from New England to the South, machinery producers followed to be closer to their customer base. Today a few former Massachusetts companies still manufacture equipment under new ownership in the South.

The loss of the textile machinery industry had a serious impact on Massachusetts. Between 1974 and 1979 at least eight large firms closed. The 2,762 employees of these eight firms received special assistance under the United States Trade Adjustment Assistance Program. Company towns in Massachusetts such as Hopedale (home of Draper Looms) and Whittinsville (home of Whittin Machine Works) were left devastated by the loss of their oldest and largest employers.

Since 1979 a number of other firms have closed: Crompton & Knowles, James Hunter Machines, and Davis & Furber. (Recently, James Hunter was sold to a New Jersey firm interested in one of its specialized industrial machines for the paper industry). These companies closed for a variety of reasons. James Hunter and Davis & Furber were hit especially hard by problems with their product liability insurance. Recent court decisions have made machinery manufacturers liable for on-the-job injuries resulting from their machinery no matter how long ago that machinery had been sold. Although this is a national issue, these two Massachusetts firms were especially hard-hit because of the type of machinery they produced and their large installed base of very old machinery. As a result, it was virtually impossible for these companies to get product liability insurance. Insurance costs at one company increased from \$3,000 to \$180,000 in two years. In the third year they were



unable to get insurance at all. A second Massachusetts' company was only able to buy insurance at an exorbitant price and then only with a \$100,000 deductible. The liability problem made continuing operations or selling this company unlikely.

Crompton & Knowles, one of the oldest manufacturers in the state, did make attempts to keep up technologically with their European competitors. They invested significantly in the development of state-of-the-art looms. A Massachusetts textile manufacturer committed to buying American equipment was one of the first purchasers of the new looms. According to the textile company, the looms were a constant source of problems and was one of the primary reasons the textile company eventually was forced into bankruptcy. Crompton & Knowles closed soon after that.

A number of textile machinery companies do remain in Massachusetts, but the Commonwealth is no longer the center of the industry. Companies that remain primarily supply spare parts and accessories or very specialized machinery, such as non-woven textile machinery.

#### Future Prospects

According to projections of the U.S. Department of Commerce, product shipments of textile machinery in 1984 are expected to rise about 5% over 1983. This increase after four years of declining sales is based on increased demand by textile mills for yarn and warp preparatory equipment.

The U.S. Commerce Department also predicts an average annual growth rate of 3% over the next five years, based on the assumption that U.S. manufacturers, recognizing their competitive disadvantage, will expand their research and development programs and design equipment which is competitive in technology, dependability, and price. The industry will remain centered in the industrially advanced nations because of the high precision engineering standards required, and the introduction of microprocessors. The issue facing the U.S. industry is whether it will meet the challenge of the international market. The current president of the ATMA, recognizing the importance of product innovation said, "The United States textile machinery manufacturer not only has to be willing to spend the necessary money to make his equipment the best in the eyes of the customers in his own domestic market, he also has to be competitive on the world market."

Catching up technologically with their competitors will not be an easy task for U.S. firms. The percentage of U.S. patents in the industry continues to decline and the future for technological innovation is threatened by the serious derth of textile engineering graduates. Recapturing



international market share will depend on new leadership in the industry and long-term strategic planning by company managements.

### Policy Issues

The U.S. textile machinery segment is in a period of consolidation. The companies which remain will be the ones willing to develop innovative machinery and implement cooperative marketing strategies.

The successful turnaround of a declining New Hampshire manufacturer of yarn winding machines provides an interesting model from a public policy perspective. Abbot Machine Works, one of only two remaining winding machinery companies in the U.S., saw its 30% share of the U.S. winding machine market decline to 2% as a result of increasing international competition. European machines were more expensive than Abbot's, but were much more productive and automated. In 1979 Abbot was bought by new owners interested in designing and marketing a winding machine competitive with those manufactured in Europe. The owners received \$233,000 in technical assistance and a \$1 million direct loan from the New England Trade Adjustment Center in Boston. As a result of this assistance, Abbot has been able to successfully manufacture a state-of-the-art winding machine. It now is waiting for the dollar to weaken so it can compete more effectively with imports.

Although this model cannot be duplicated in all cases, and is in fact much too late for the vast majority of Massachusetts textile machinery manufacturers, it does illustrate that with aggressive management and a willingness to take risks, some companies will be able to compete successfully in the international marketplace. Companies can also remain viable by developing specialized niches. In Massachusetts a few companies are involved in manufacturing machines for the growing non-wovens market. This market includes innovative new products such as geotextiles, environmental filters, synthetic leather and hospital disposables. Machinery to produce these new products are highly technical and of increasing importance. Massachusetts companies are likely to play a critical role in this specialized market.

## THE PRINTING MACHINERY SEGMENT

### Introduction

Although printing machinery is an extremely old industry, dating back to Gutenberg's invention of moveable type, it is a new industry in Massachusetts. In 1965 only about 600 individuals were employed in printing machinery



businesses in Massachusetts, accounting for approximately 3% of total U.S. industry employment. By 1981, there were over 6,000 such employees in Massachusetts, or about 35% of total domestic printing machinery employment.

These figures do not provide a complete picture. Many major companies which have been associated with the growth of printing machinery in the Commonwealth and which primarily serve the printing industry, are not classified in the same SIC code. Total job creation in Massachusetts by all companies serving the printing industry is probably closer to 8,000 jobs.

The story of this phenomenal job growth is basically one of technological leadership. Massachusetts companies were, and continue to be, in the forefront of innovations in the pre-press machinery field. From the first phototypesetting machine in the 1960s, to the latest technological advances in laser printers, Massachusetts companies have been responsible for revolutionizing the printing process.

#### Segment Performance

Within the SIM industry, printing machinery has been the fastest growing segment. While SIM had a domestic employment increase of 9% between 1965 and 1981 there was a 27% increase in printing machinery employment (Exhibit 6).

Between 1972 and 1983 the value of printing machinery shipments grew 33% after adjustments for inflation. Although the recent recession has affected the industry--the value of 1982 and 1983 shipments in real dollars was below 1981 levels, and total employment in the industry declined to only 24,000 employees in 1983 from a peak of about 33,000 in 1980--the industry is expected to resume growth in 1984.

Much of this growth is due to technological advancements that have created new products for the industry and resulted in significant cost savings for other markets. An important example of this is the newspaper industry, whose interest in labor-saving capital investments encouraged many of the technological advancements in printing machinery.

The links between technology and changes in the printing industry market are described in the following two sections.

#### Technological Advancements In Printing Machinery

Advances in printing technology have historically changed the markets for print, the structure of the printing industry, and the geographic location of the industry. As far back as 1884, the invention of the first linetype typesetting machine led to the emergence of catalogue publishing in the U.S. and to the dominance of the



Mergenthaler Company in printing machinery for close to 100 years. The pace of innovations in the industry remained relatively slow until the mid 1960s, when the transition from letter press to offset press and the invention of phototypesetting revolutionized the business. The pace of technological advances since this period has increased dramatically.

The commercial development of phototypesetting was the result of the research and development efforts of the two largest printing machinery companies, Harris and Mergenthaler of New York and Photon, a small Massachusetts company. Photon received support for developing commercial phototypesetting during the 1950s by the Graphic Arts Research Foundation (GARF). GARF was established in 1949 as a non-profit industry-supported organization designed to underwrite research in printing technologies and specifically, the development of a photo composing machine. Foundation members were primarily newspapers concerned with rising production costs and looking for a way to increase the efficiency of the printing process.

GARF provided funds to Photon (originally Lithomat), which had the product rights to two French inventions. In exchange for research and development funds, patent rights for the machine were assigned to the Foundation. This investment led to the commercialization in the early 1960s of phototypesetting machines: computer driven devices that produce type characters, as well as rule and other symbols, by exposing photosensitive material to concentrated rays of light.

The second major change in printing machinery occurred in 1968 when Compugraphic Corporation of Massachusetts, a spin off of Photon, developed the first low cost phototypesetting machine. At the time, machines built by Mergenthaler and Harris cost about \$80,000. Compugraphic was able to manufacture a machine with the same capabilities for \$15,000, making low-cost phototypesetting equipment affordable to the vast majority of newspapers for the first time. As a result of this innovation, Compugraphic became the leading company in the world-wide typesetting market and one of the fastest growing companies in the U.S. during the 1970s.

Recent innovations are again producing radical changes in printing machinery, making even phototypesetting equipment obsolete. Phototypesetting has two components: the front-end system (consisting of a keyboard, visual display screens, a microcomputer, and software) and the actual typesetting equipment. The advent of personal computers, word processing systems, "intelligent copiers," laser printing, and direct-to-plate printing have changed both components of the phototypesetting process.



It is now possible to take information from a personal computer and produce copies of the document directly with a device similar to a copy machine. In the newspaper industry new direct-to-plate technology is being developed where page make-up is done by editors on a video screen and output goes directly to plate with no phototypesetters, no composing room, and no platemaking department. A system of this type has just been installed in a Utica, New York newspaper. Xerox has developed an electronic publishing system which eliminates the need for typesetting, platemaking, the conventional printing press, and collators.

The integration of the new revolution in information processing and printing is best illustrated by the recent link between the new Apple LISA personal computer and Compugraphic. This system uses Compugraphic-developed software in a LISA personal computer to drive a Compugraphic typesetter and an electronic printer. The new system allows offices to convert from typewritten copy to typeset copy, which is easier to read and saves space.

These technological innovations bring the printing machinery industry to the cutting edge of the high technology field. Although the SIC code for this industry, 3555, is not included in the commonly held definition of the high technology industry, most companies in the phototypesetting industry consider themselves in the forefront of the information revolution. Particularly in Massachusetts where Wang and Digital have been directly competing with printing machinery manufacturers, the distinction between high technology computer software companies, hardware companies, and printing machinery companies is blurring.

Companies such as Atex and Xyvision of Woburn, Textet, Quadex and Kurzweil of Cambridge, and ECRM and Scitex of Bedford are high technology companies primarily serving the printing market and are closely associated with or competitors of printing machinery manufacturers.

### The Printing Machinery Market

As the technology in printing machinery has evolved, there has been a dramatic change in the market for equipment. There are three basic markets for printing machinery:

- the newspaper and publishing industry
- in-plant operations; and
- commercial printers.

Newspapers have historically been the largest market for printing equipment and have been a major force in the introduction of new technologies. There are about 1,700 daily newspapers and about 10,000 weeklies in the U.S. To



remain competitive with other media, newspapers had to develop systems which minimize the time needed to get a news story into print. Newspapers also pushed for technological advances to reduce their labor costs. With recent technological advancements, the process of printing a newspaper has been revolutionized in the past decade. The changes in newspaper publishing have spilled over into both book and periodical publishing. This market is not as large, however, and requires a somewhat different type of equipment.

In-plant publishing, the second major market, has shown the most dramatic growth in the past 15 years. According to one industry source, there are over 80,000 U.S. companies and organizations with in-plant printing operations and the in-plant market is growing by 17% annually. As typesetting equipment has become cheaper, more productive, and easier to operate; business, government, and educational institutions have established in-house printing operations. Examples of in-plant publishing would include the printing of forms, insurance policies, manuals, reports, and catalogues.

The commercial printing market includes the large "type houses" that serve the high quality needs of the advertising industry; the high volume commercial printers producing catalogues, directories, yearbooks, and technical manuals; and the smaller commercial printing establishments, including copy shop franchises such as Speedy, Kwik Copy, and Postal Instant Press. There are about 60,000 commercial printers in the U.S. The growth of office automation systems poses a real threat to this market, especially to the smaller printers.

### Industry Structure

There are about 600 establishments involved in manufacturing presses, book binding machinery, and typesetting machinery in the U.S. Only about 12 firms employ more than 500 workers. Four companies account for about 40% of total shipments.

Printing machinery production has long been dominated by a few large firms involved in a wide variety of printing machinery products from phototypesetting to presses. Typesetting equipment in particular is dominated by a few firms. In 1982 Compugraphic controlled about 25% of total world-wide typesetting equipment sales of \$1.18 billion. Other Massachusetts companies, Atex and Itek, controlled an additional 11% of the world market. As one analyst noted, "more typesetting equipment in place in the world is manufactured in Wilmington, Massachusetts than in any other location."

The industry is currently going through an acquisition phase. The profitable part of the business is not the



equipment, but the expendable supplies. As a result, companies in the film and supplies industry have been interested in buying machinery companies for marketing and distribution purposes. Recent acquisitions of Massachusetts firms in the industry have included the purchase of a controlling interest in Compugraphic by the German company Agfa-Geuvert, the purchase of Itek by Litton Industries, and Kodak's acquisition of Atex. It is too early to say what impact these acquisitions will have on the industry in the Commonwealth.

### International Trade

Unlike many other traditional industries, the balance of trade in printing machinery improved significantly between 1965 and 1981, as export growth exceeded import growth (Exhibits 3 and 9). U.S. companies were able to increase their share of foreign markets by aggressive merchandizing and capitalizing on their technological advantage in pre-press equipment and the offset process. It is only since 1981 that exports have declined and the balance of trade deteriorated. In 1983 exports fell 11% and as a percentage of total shipments, were at their lowest since 1972.

The export market is dominated by roll-fed offset presses and phototypesetting machinery. The European Common Market accounts for 35% of U.S. exports and Canada an additional 18%. U.S. exports of phototypesetting machines reached their peak in 1979 when about \$125 million worth of equipment was exported. Since that time exports of this type of machinery have declined to about \$84 million. This decline is due to two factors. First, the strength of the dollar against foreign currencies has made U.S. manufacturers uncompetitive on the basis of price. Second, European and Japanese manufacturers have become more aggressive and are beginning to market competitively priced, technologically advanced, phototypesetting equipment.

Imports of printing machinery have been rising since 1967 (Exhibit 9). According to the U.S. Department of Commerce Industrial Outlook, import penetration (the percentage of total consumption accounted for by imports) has also increased dramatically, from about 9% in 1967 to over 23% in 1982. Fifty-four percent of all imports come from West Germany, followed by Japan with 14%, the United Kingdom with 12%, and Switzerland and Italy with 6% each. A large part of these imports are in sheet offset presses, an area in which few U.S. manufacturers and no Massachusetts companies compete. In 1981 only about \$20 million of the \$386 million of total imports was in phototypesetting machines, which are the mainstay of Massachusetts manufacturers.



### Future Prospects

The U.S. Department of Commerce projects that printing machinery shipments will grow at an average annual rate of about 4% over the next five years after adjusting for inflation. This growth is based on the continuance of research and development investments and successful export efforts which would enable U.S. firms to maintain their share of the international market.

Massachusetts firms are at the forefront of new technologies. They have continued to invest in new products and hope to face the challenges posed by the new "intelligent copiers" and direct-to-plate technologies. Kodak-Atex and Agfa-Compugraphic have been cited as two companies to watch in the rapidly growing area of laser printing.

There is some possibility that international competition might affect Massachusetts companies. The differences between European and U.S. printing systems have been rapidly narrowing. Both West Germany and Japan are beginning to look more aggressively at the U.S. printing machinery market and many domestic companies are expecting the Japanese to break into the U.S. market.

### CONCLUSIONS

The stories of the textile and printing machinery segments of the SIM industry illustrate the continuing importance of technology to traditional industries. U.S. textile machinery companies were unwilling to invest in developing new generations of equipment. Its customers, the textile manufacturers, did not pressure them to come up with more productive machinery. In addition, they were not motivated to do so because in the short run it was more profitable and less risky to focus on the replacement parts, service, and accessories business. This left the door open to foreign competitors who had developed new production processes. Only after it was too late did U.S. textile machinery manufacturers realize they were competing in an international marketplace.

In contrast, printing machinery manufacturers were pressured by their customers, primarily newspapers, to find more cost-effective and timely ways to produce print. These customers provided investment capital to printing machinery manufacturers. By doing this they shared the risk of new product innovation while reserving the patent rights to the innovations they financed. This gave a small Massachusetts company the ability to develop a worldwide position in the industry and generated spinoff companies which have been a source of employment growth in the state.

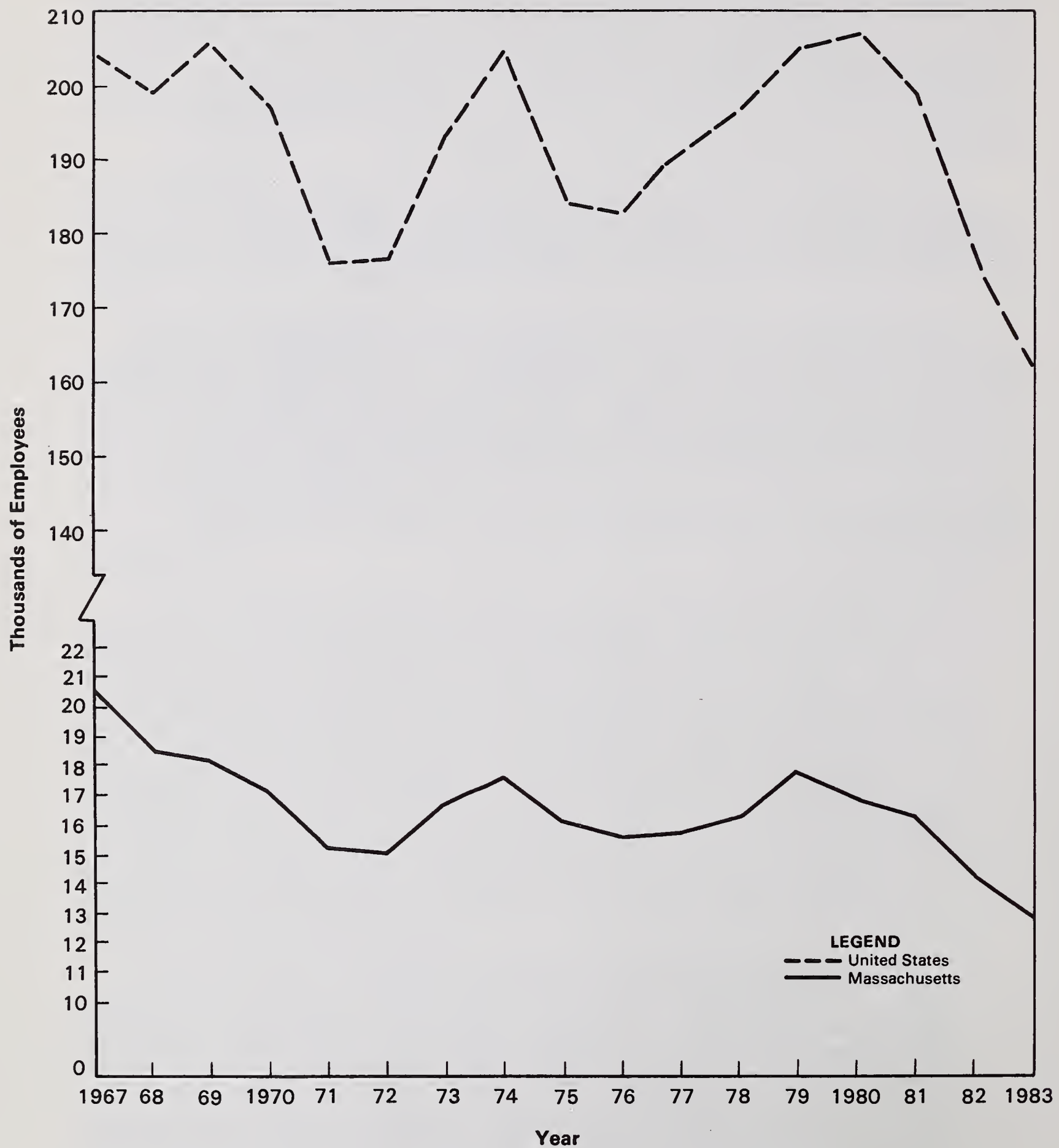
Industry dynamics can have a significant impact on a company's willingness to invest in improving its product line. When companies are too small, customer groups unaggressive, competition somewhat lazy, or alternative sources of revenues and profits available; firms may tend to make do with marginal improvements in their products that barely differentiate themselves from competition. If companies can be fairly sure that competitors will not undertake major investment programs in new generations of technology (assuming they face the same set of industry dynamics) they will not risk it themselves.

This makes sense in the short run in a purely domestic market situation. However once customers realize that imported machinery can offer them superior performance, the domestic supplier industry's days are numbered.

From a public policy perspective it is possible to help companies become aware of advancements in technology and the potential of international competitors. It is also possible for the public sector to help share the risk of developing new generations of equipment. This can be done through financing mechanisms which bring the public sector in as a partner in such endeavors when the private sector, for a variety of reasons, is unwilling or unable to participate. The Commission's recommendation for a product development fund is a first step in this direction.

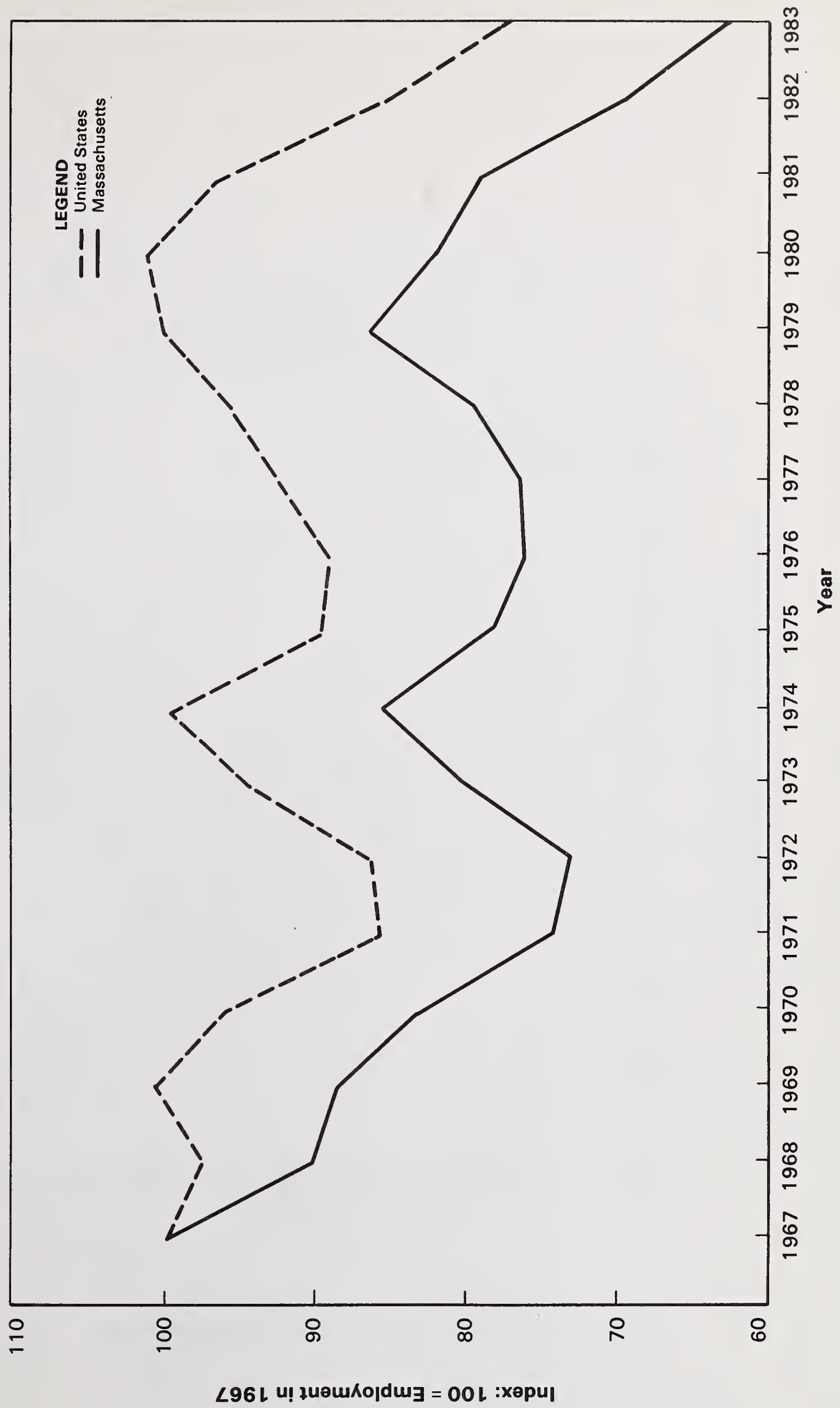


# **EXHIBIT 1** **Special Industry Machinery Employment in the** **United States and Massachusetts**



Source: United States Department of Labor, Bureau of Labor Statistics

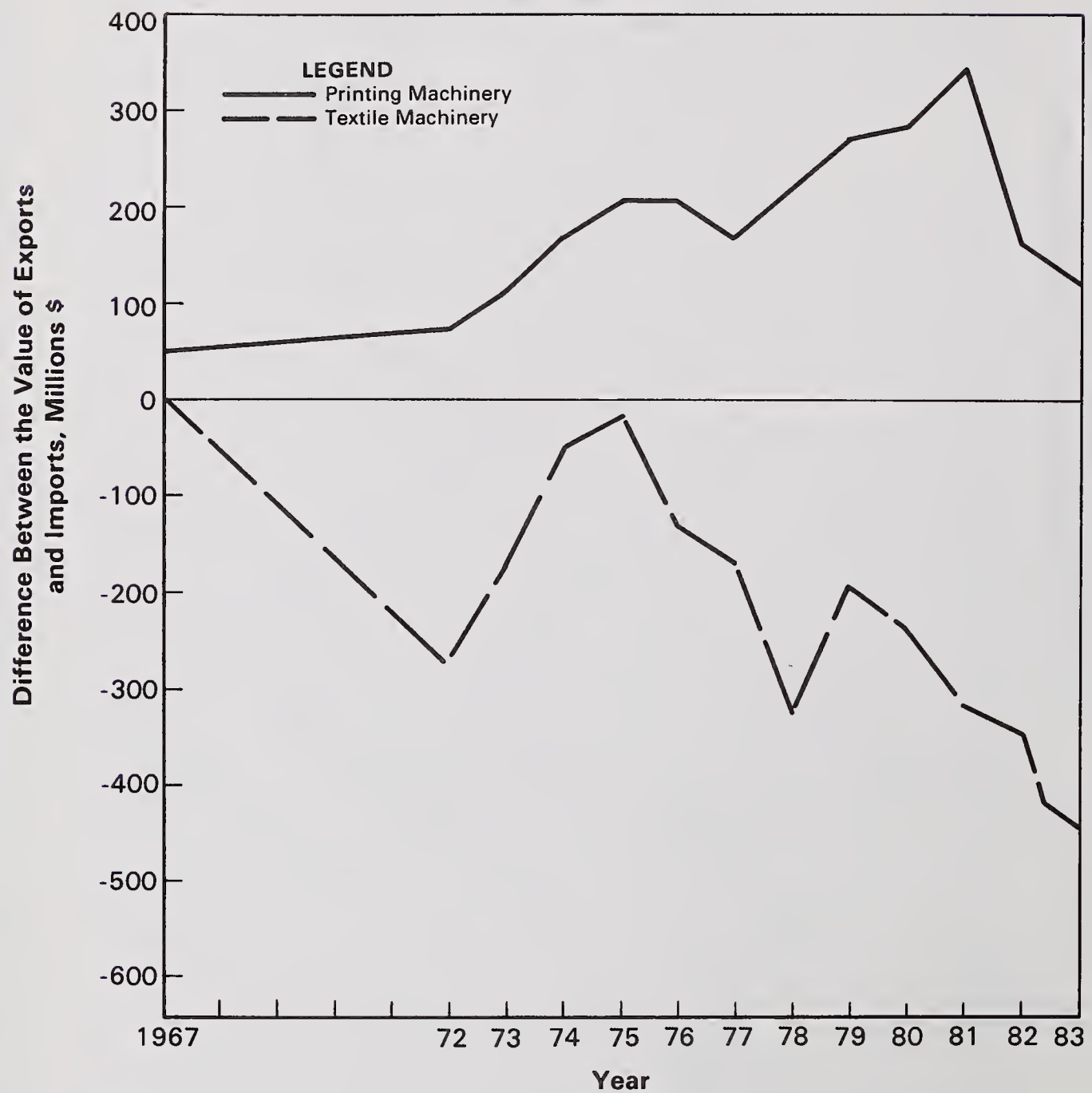
**EXHIBIT 2**  
**Index of Special Industry Machinery Employment**  
**in the United States and Massachusetts**



Source: United States Department of Labor, Bureau of Labor Statistics



**EXHIBIT 3**  
**Balance of Trade in**  
**Printing and Textile Machinery**



Source: United States Department of Commerce: U.S. Industrial Outlook

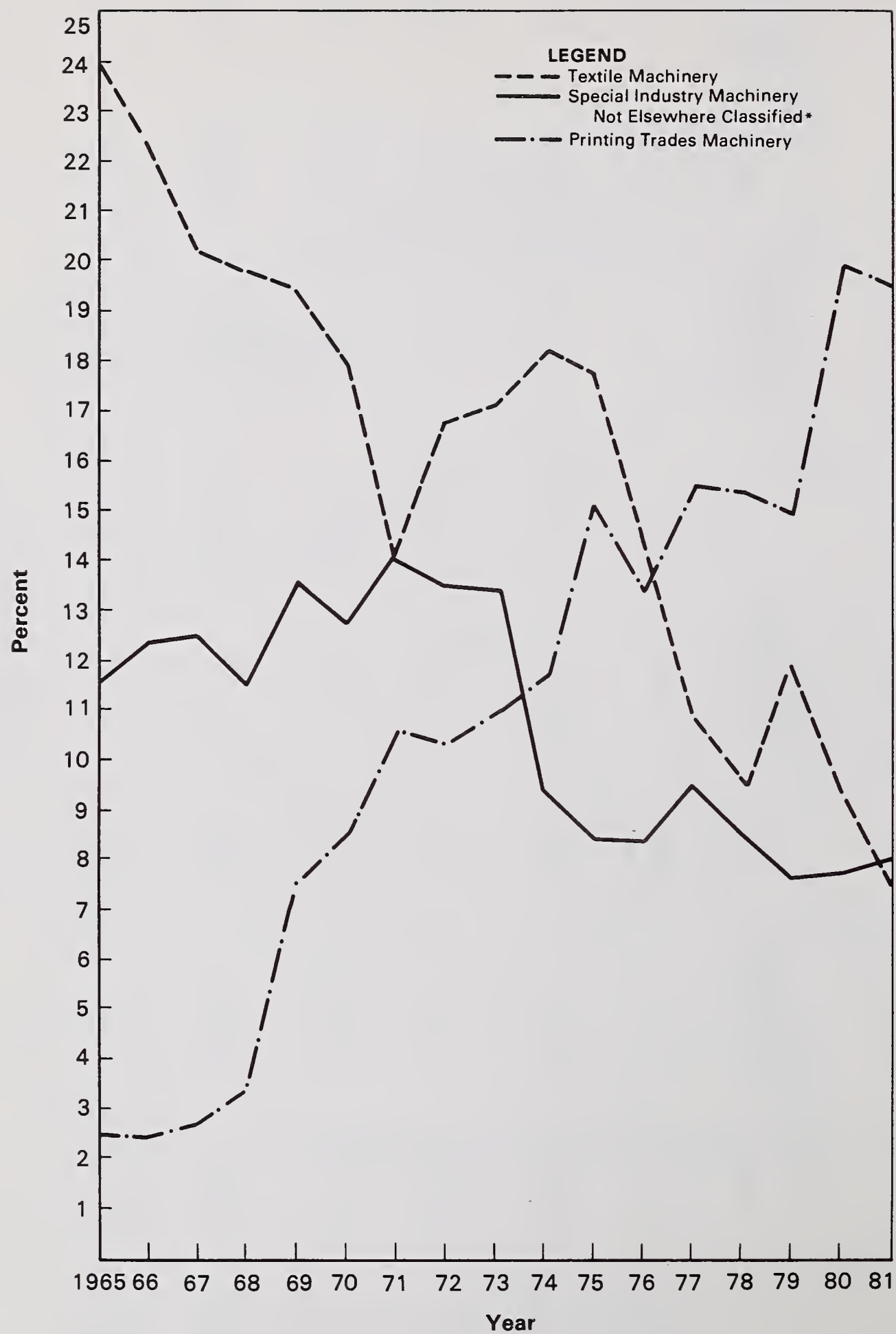
**EXHIBIT 4**  
**Massachusetts Employment as Percent of United States**  
**Employment in the Special Industry Machinery Industry**

	1965			1981		
	UNITED STATES		MASSACHUSETTS	UNITED STATES		MASSACHUSETTS
	TOTAL	% OF INDUSTRY EMPLOYMENT	TOTAL % OF INDUSTRY EMPLOYMENT	TOTAL	% OF INDUSTRY EMPLOYMENT	TOTAL % OF INDUSTRY EMPLOYMENT
Food Product Machinery	33,243	17.7%	1,683 8.0%	39,936	19.4%	1,155 6.6%
Textile Machinery	40,054	21.3%	9,681 45.8%	26,381	12.8%	1,933 11.1%
Woodworking Machinery	13,141	6.9%	183 .9%	11,413	5.5%	177 1.0%
Paper Industry Machinery	19,292	10.3%	2,313 10.9%	18,627	9.1%	1,882 10.8%
Printing Trades Machinery	24,869	13.2%	602 2.8%	31,597	15.4%	6,088 34.9%
Special Industry Machinery Not Elsewhere Classified	57,475	30.6%	6,666 31.6%	77,723	37.8%	6,209 35.6%
Total						
Special Industry Machinery	188,074	100.0%	21,128 100.0%	205,677	100.0%	17,444 100.0%

Source: United States Department of Commerce, Bureau of the Census: County Business Patterns



# **EXHIBIT 5** **Massachusetts Share of United States Employment** **in Special Industry Machinery**



\*Includes machinery for the shoe, plastics and other industries.

Source: United States Department of Commerce, Bureau of the Census: County Business Patterns

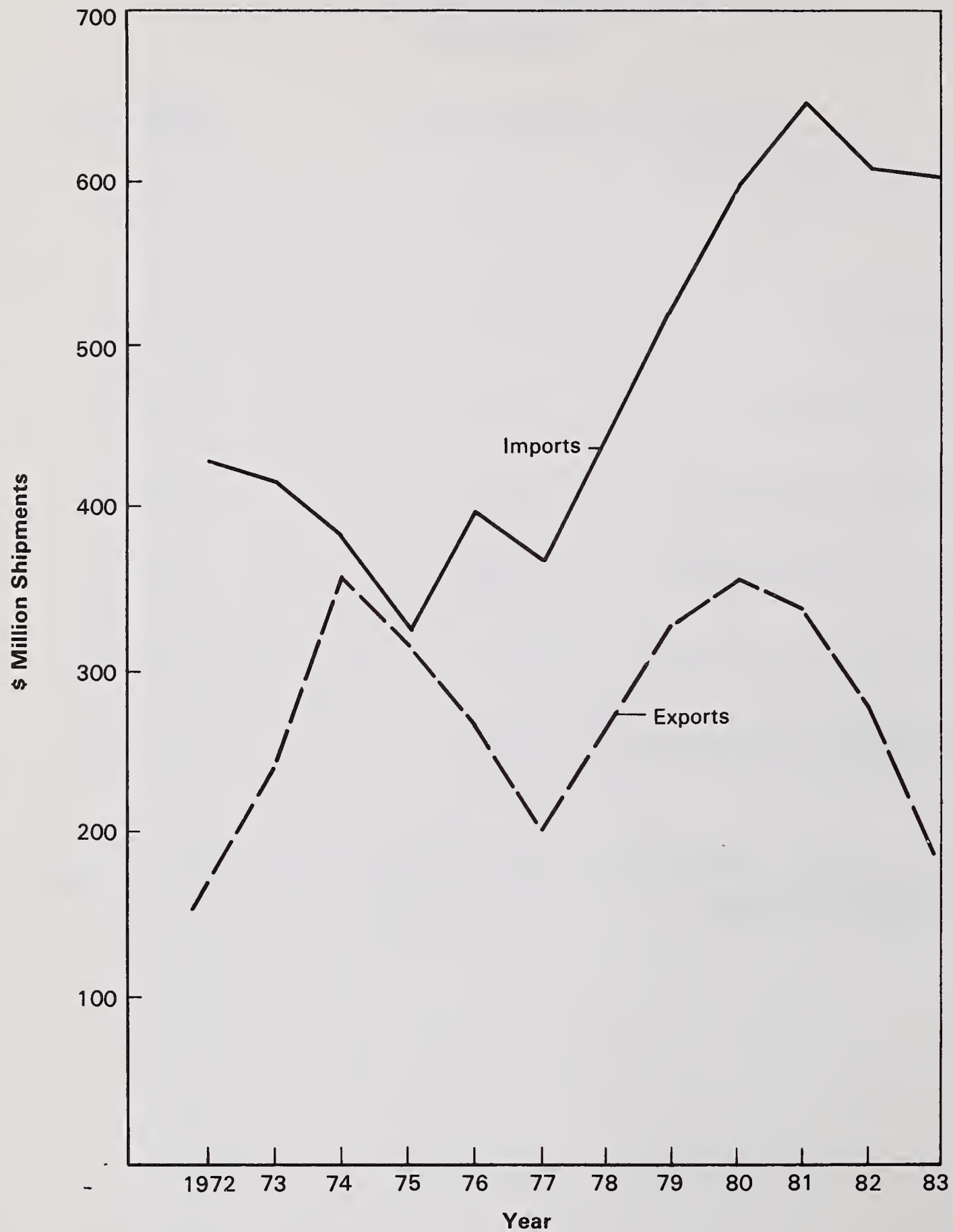
**EXHIBIT 6**  
**Change in Special Industry Machinery Employment**  
**1965-1981**

	<u>UNITED STATES</u>	<u>MASSACHUSETTS</u>
Special Industry Machinery	+9.4%	-17.4%
Food Product Machinery	+20.1%	-31.4%
Textile Machinery	-34.0%	-80.0%
Woodworking Machinery	-13.0%	-3.3%
Paper Industry Machinery	-3.4%	-18.6%
Printing Trades Machinery	+27.0%	+911.3%
Special Industry Machinery Not Elsewhere Classified	+35.2%	-6.9%

Source: United States Department of Commerce, Bureau of the Census: County Business Patterns

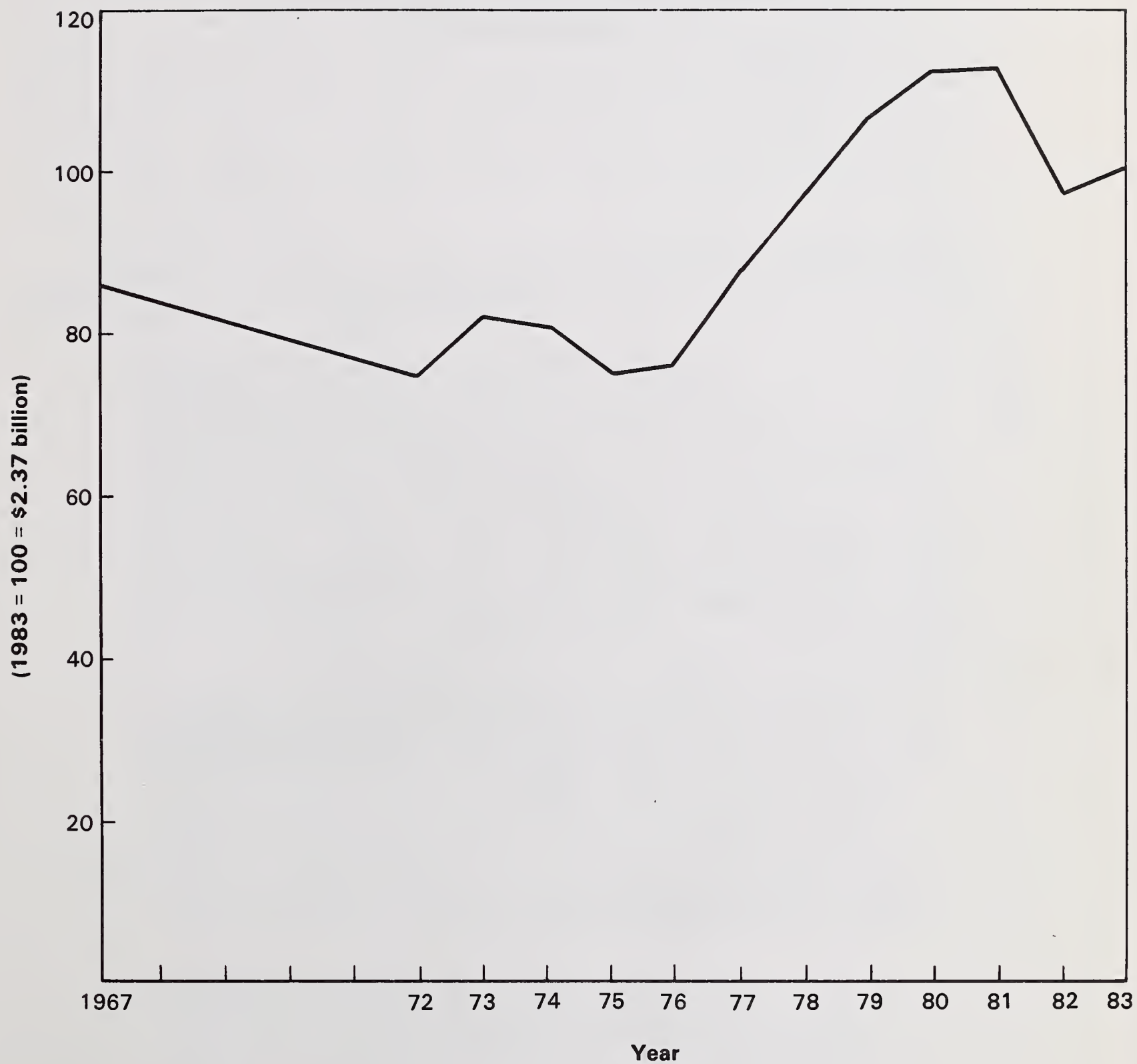


**EXHIBIT 7**  
**The United States Textile Machinery Segment**  
**Imports and Exports**



Source: United States Department of Commerce: U.S. Industrial Outlook

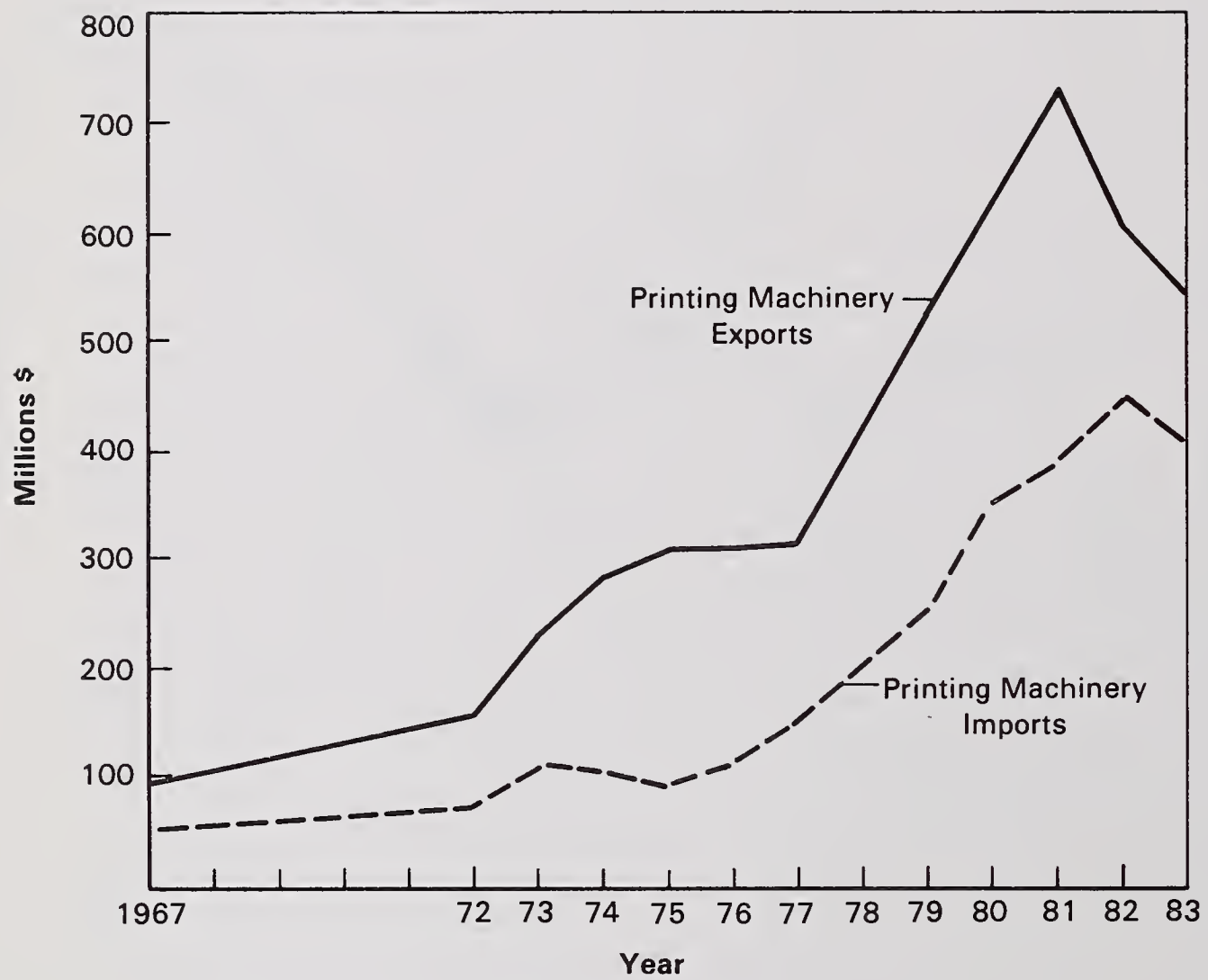
**EXHIBIT 8**  
**Printing Machinery**  
**Index of Real Industry Shipments**



Source: United States Department of Commerce: U.S. Industrial Outlook



**EXHIBIT 9**  
**United States Printing Trades Machinery**  
**Imports and Exports**



Source: United States Department of Commerce

## THE METALWORKING MACHINERY INDUSTRY

New England was the birthplace of the U.S. metalworking machinery industry and maintained its leadership position through most of the 19th century with Worcester, Massachusetts as its center. As the automobile industry developed in the early 20th century, the metalworking machinery industry followed it to the Midwest. Although no longer as important as it was nationally, the industry in Massachusetts is still important in certain regions. Unlike some industries that have already experienced their worst declines, the metalworking machinery industry is currently at a critical stage. Further contraction of employment is likely, with the potential to cause problems for certain regions of Massachusetts.

For the purpose of this study, the industry has been divided into three major segments, using Standard Industrial Classification code definitions:

- Machine Tools (SIC 3541 and 3542):  
companies that manufacture both metal cutting and metal forming machine tools; "powered, not hand-held, both metal cutting and metal forming, devices that cut, form and shape metals" used in the manufacture of other products. Examples of machine tools include lathes and mills. The market is international with the automotive and aerospace industries, as well as the metalworking machinery industry itself, as major customer groups.
- Cutting Tools/Accessories (SIC 3545):  
companies which manufacture accessories and attachments to machine tools and other metalworking machinery including taps, thread cutting dies, twist drills, gauges and reamers. These products are not capital equipment, but expendables, since they wear out. The market for these products is increasingly national with the automotive industry constituting the largest customer group.
- Special Tools And Dies (SIC 3544):  
companies producing the special tools, dies, fixtures and molds indispensable for the mass production of metal parts. This segment is composed primarily of small contract machining shops serving other metalworking machinery manufacturers. The products are "custom made" and thus the industry is very closely tied to the local economy. Examples include molds used by



the plastics industry and die sets for metal stamping.

Other segments of metalworking machinery include power driven hand tools and rolling mill machinery and equipment. They are not significant employers in Massachusetts and are therefore not considered as part of this study.

The metalworking machinery industry currently accounts for .5% of employment in Massachusetts, down from .9% in 1965. That represents a decline from 17,500 to 13,500 jobs by 1983.

U.S. and Massachusetts employment trends in metalworking machinery is evidence of the extreme cyclicalality of the industry (Exhibits 1 and 2). The industry in Massachusetts was especially hard hit during the 1967 through 1971 downturn. The decline in employment was both more severe in Massachusetts and longer lasting. In fact, Massachusetts never fully recovered from the severity of the downturn during this period, while U.S. employment did during three upturns. As a result, Massachusetts lost share of U.S. employment between 1965 and 1981, especially in cutting tools, where it dropped from 13% to 10% (Exhibit 3).

Beginning in 1976, the industry both nationally and in the state, witnessed a strong upturn. In both the tool and die and cutting tool segments, state employment rose to a fifteen year peak in 1979 and 1980 respectively. Massachusetts employment in the machine tool segment increased by close to 50% during this period. Although showing great strength, the machine tool segment in Massachusetts still did not regain the jobs lost during the late 1960s. Even at its peak in 1981, employment was 1,000 jobs less than in 1965 (Exhibit 4).

The mix of segments within the metalworking machinery industry differs significantly between Massachusetts and the U.S. Cutting tools are a much larger component of the industry in Massachusetts than in the country (Exhibit 5). In Massachusetts 37% of all metalworking machinery employment is in cutting tools, while in the U.S., cutting tools accounts for only 18% of industry employment.

Although data at the segment level for Massachusetts is not available in a consistent form for 1982 and 1983, information from the Massachusetts Division of Employment Security and interviews with industry experts point to the seriousness of the job loss in the metalworking machinery industry since 1981. Between the fourth quarter of 1981 and the first quarter of 1983, employment in the industry has declined 24% for a loss of 4,000 jobs. The cutting tool segment in particular has seen a dramatic decline in



employment and the situation has not yet stabilized. A fair estimate would be that at least 50% of the current cutting tool jobs are in serious jeopardy.

Geographically, the industry is concentrated in the Worcester and Boston LMAs. However the area in which it accounts for a significant proportion of regional employment is Athol, where it represents 26% of employment. In Greenfield and Southbridge, it represents close to 4% of all jobs (Exhibit 6). The industry's decline between 1980 and 1983 affected the regions differently. The most dramatic decline was in Greenfield, with a 60% loss of industry employment during this three year period. Worcester, Athol and Fitchburg-Leominster also experienced serious employment declines.

The impact of the decline in the Massachusetts metalworking machinery industry on the state's workforce is magnified when the labor force composition of the industry is considered. Nationally, about 46% of industry employment is composed of highly skilled machinists. As an economist from Northeastern University noted, "these workers are at the top of the occupational ladder among skilled craftsmen". Older than average, these workers' age adds to the difficulty of their adjusting to the dislocation cause by the decline of the metalworking machinery industry.

As stated, metalworking machinery is a highly cyclical industry. A number of factors, however, indicate that current and future declines are structural in nature as well. These factors include:

- Competition from low wage nations, particularly in mass produced, relatively standard parts (cutting tools, low-end machine tools)
- Competition primarily from Japan in more sophisticated products (high-end machine tools)
- Changes in materials and production processes which reduce demand (cutting tools)
- Imports of automobiles and capital goods which also reduce U.S. demand (machine tools and cutting tools); and
- An industry structure in the U.S. which has stifled investment in new products, caused periodic shortages of skilled labor and hurt customer service (machine tools).

The reasons for these trends and their likely impact on the Commonwealth's economy are discussed in a more detailed analysis of machine tools and cutting tools. Special tools



and dies are not discussed since this segment of the industry, while important to the state, is primarily composed of very small shops working closely with local industry.

#### MACHINE TOOLS

Machine tools such as lathes, milling, planing, drilling, boring and grinding machines are the backbone of the U.S. metalworking industry. They are needed to produce all sophisticated products using metal, including automobiles, airplanes and heavy machinery.

Traditionally the U.S. has been the world leader in the production of machine tools, as well as the world's largest market and the world's second largest exporter. In recent years this leadership has been challenged. The Japanese have become important competitors in the high technology parts of the industry and the Taiwanese and Koreans in low value-added products. The rise of Japanese competition has been extremely rapid and important. An importer of machine tools from the U.S. ten years ago, the Japanese now control over 11% of the U.S. market, with further gains predicted. Total imports now equal 27% of the U.S. market. As of 1983, U.S. manufacturers were operating at 40% of capacity.

Many observers of the industry believe that the explosion of imports into the U.S. and the recent deep recession in the American economy will lead to a large and permanent contraction of the industry within a few years. The severity of the decline in the U. S. machine tool industry is evident when analyzing the value of its shipments over time (Exhibit 7). The value of output in 1983 dollars has declined over 71% since 1967. In fact, a recent U.S. Department of Commerce study found that this decline was more severe than that experienced by any other U.S. manufacturing industry during this period. The potential demise of U.S. machine tool manufacturing raises profound questions about the future competitiveness of all U.S. manufacturing. In its 1984 United States Industrial Outlook, the U.S. Department of Commerce states that "the future success or failure of United States industry depends on the success or failure of the machine tool industry."

Although machine tool manufacturing in Massachusetts is no longer a significant employer in the state, nor an important component of the national industry, it is important to review its current status for three reasons. First, machine tool employment continues to be an important part of the Worcester economy. Second, the historic contraction of the industry in the state has had a profound impact on highly skilled machinists and metal machine workers in the state. The decline of the machine tool industry has created a surplus of skilled labor. Many machine tool workers have



been forced to take jobs significantly below their previous skill and wage levels. Finally, there are a few Massachusetts companies at the cutting edge of the technological changes in the industry. An overall industry assessment provides insight into the future potential of these Massachusetts companies.

### Cyclicalilty of Machine Tools

Like the entire metalworking industry, U.S. machine tool manufacturers are typically small firms. In 1980, for example, of 1,449 companies, only 16 establishments had over 1,000 employees and 40 employed 500 or more. The top 20 firms control only 60% of production. The fragmented nature of the industry has made it difficult for individual companies to weather another characteristic of the business: its extreme cyclicalilty.

This cyclicalilty in new orders for machine tools (often increasing 50% to 100% in a two or three year period) has had three significant effects on the machine tool industry. First, it makes firms reluctant to invest in new plants and equipment needed to meet peak demand. Experience has shown the industry that new equipment ordered during peaks in the business cycle is often underutilized shortly after installation. Second, cyclical demand has caused machine tool firms to backlog orders as a hedge against downturns. As a result, customers can face order times of over one year during an economic recovery. Third, despite an attempt to stabilize production by backlogging orders, employment in the industry dramatically fluctuates with business cycles. Between 1969 and 1971, for example, the number of production workers in the industry fell by 40%. Many production workers are highly skilled machinists and once lost to the industry, cannot be rehired. Paul Cooper, the President of Acme-Cleveland Incorporated, a leading producer of machine tools, noted in Congressional testimony in 1981 that "the availability of skilled labor is one of the two major problems in the industry" and the National Academy of Sciences reports skill shortages and surpluses at all levels.

### Technological Change In Machine Tools

The ability of an industry to innovate depends on the industry's own resources and relationships between the industry and its customers. In many industries innovation is essential to remaining competitive and customers are willing to support research and development to build new products. Numerous factors in the American machine tool industry have actively worked to discourage innovation. These are:

- The largest consumers of machine tools purchase specialized equipment. The automobile and aerospace industries, for example, which purchased



over 35% of all machine tools shipped between 1978 and 1982, buy overwhelmingly customized equipment which is prepared especially for long production runs. Experience gained through producing this equipment builds special expertise, much of which will not lead to innovations in the standard products bought by small firms.

- Many of the most sophisticated and technologically advanced American manufacturing corporations build their own machine tools. By building machines in-house, firms reduce the pressure on machine tool manufacturers to innovate.
- Product innovations have been slow to gain acceptance in the marketplace. "American Machines: 13th Inventory of Metalworking Equipment" published in 1983 noted that only 31% of the metal cutting tools used in American factories were under 10 years old, the smallest percentage of any major country.

For example, computer numerical control (CNC), the most important product innovation in machine tools since World War II, did not make a significant impact on the market for twenty years. Part of the reason for the slow progress of CNC has been the reluctance of customers to pay the higher initial costs associated with the purchase of CNC machine tools, even when there are long-term cost savings.

#### The Rise In Imports 1977 - 1982

A variable profit margin, production backlogs, limited successful innovation and a shortage of skilled labor all have been and continue to be significant problems for American machine tool manufacturers. However they are not enough to explain the crisis which now exists. Every one of these problems was at least as serious in 1977 as it is today. Yet in 1977 the U.S. ran a \$97 million balance of payments surplus in machine tools and was still acknowledged as the world's technological leader. In order to understand the crisis of the mid-1980s, it is necessary to identify those market factors which, beginning in the mid to late 1970s, amplified and exploited the long standing competitive weaknesses of U.S. machine tool manufacturers.

The present crisis for American machine tool producers began, paradoxically, with a sharp rise in demand in the late 1970s. Between the fourth quarter of 1976 and the fourth quarter of 1978, net new orders for machine tools rose from \$347 million to \$1.3 billion. Quarterly net orders then



remained above \$1.3 billion for six consecutive quarters, breaking all previous records. In no way was the capacity of U.S. machine tool manufacturers sufficient to meet this increased demand. By mid 1979, U.S. machine tool firms had record backlogs of \$5.4 billion and waiting times of sixteen months. Preoccupied with meeting orders for high profit machines and keeping good relations with their major customers in the automobile and aerospace industries, American firms were forced to give up the less profitable lower end of the market to Japanese firms offering prompt delivery. The results were disastrous.

The rise of imports from other countries, particularly Japan, has been the dominant challenge in the American machine tool market in the past five years (Exhibit 8). Between 1977 and 1982 imports from other nations into the U.S. rose from 13% of U.S. consumption to 27% of U.S. consumption. Japan alone increased its share of the U.S. market from 4% in 1977 to 12% in 1982. The story of the Japanese rise in machine tools closely parallels the Japanese rise in automobiles and consumer electronics. Proceeding by careful design, taking advantage of government research, export and marketing subsidies, and the use of their domestic market to develop scale economies; Japanese firms initially entered the U.S. market in the light CNC lathe market where American firms were particularly weak. After establishing leadership in this market niche, they moved into higher value added production, leaving third world nations to battle the Americans at the lower end of the product line.

Japanese ability to successfully target the U.S. machine tool market was related to three factors characterizing the U.S. industry in the late 1970s. First, there was growing customer dissatisfaction with the quality of many U.S. products. Second, U.S. manufacturers generally required long lead times for deliveries. Finally, there was dissatisfaction with after-sales service for standard equipment produced by U.S. manufacturers.

The success of the Japanese effort is tied to their ability to respond to these competitive weaknesses:

- Japanese firms realized that by mass producing CNC machine tools and machining centers to inventory, they could achieve economies of scale which would reduce costs and order times and improve product quality.
- Second, the Japanese realized that small firms constituted a large and relatively untapped U.S. market for light weight CNC machine tools. Between 1977 and 1982 the Japanese sold 64% of their production of CNC machine tools to small firms.



- Finally, Japanese firms quickly moved from low value added products to state of the art CNC machining centers and lathes. Japan now sells 50% of those products consumed in the U.S.

#### The Response Of U. S. Firms To The Japanese Challenge

U.S. firms have not been passive in the face of the rise of imports. Specific areas of response included:

- New Product Introductions: Japanese success in exporting machine tools into the U.S. was based in part on the lack of domestically produced light to medium weight, versatile and precise CNC machine tools. It is generally agreed that for several years in the late 1970s, U.S. products were not competitive in this market niche. There is some evidence now, albeit mixed, that U.S. firms are offering some competitive products.
- Horizontal Integration: In order to offer a broader product line and engage in the extensive research and development and marketing needed to compete with foreign products, American machine tool firms have moved toward the horizontal integration of production by bringing in new partners with considerable financial resources. Prior to 1980, neither the presence of conglomerates nor horizontal integration were thought to benefit machine tool production. The growth of flexible manufacturing systems has changed this calculation, because it involves the coordination of machine tool control and handling systems which often requires considerable capital expenditures.
- Greater Emphasis on Research and Development: In recent years all major machine tool builders have committed unprecedented levels of resources to research and development. Cincinnati Milacron, for example, increased its research and development expenditures 300% between 1975 and 1981. The results are evident in that 42% of its production is now in products less than five years old.
- Investments in Process Technology: A major problem for U.S. producers of machine tools is process technology. Despite recent advances, America's productivity is the second lowest among all major machine tool producing nations. Part of the reason for this low productivity



has been the reluctance of American producers to invest in the state of the art products they are selling to customers. In 1982 CNC machine machine tools accounted for only 10% of all machine tools currently in use in U.S. machine tool manufacturing facilities. This figure was significantly less than those for other U.S. industries, as well as other nations' machine tool manufacturers.

There is some evidence that this pattern of low investment is changing. In the past five years, Cincinnati Milacron, F. Joseph Lamb and Bendix Automation have all introduced automated storage and manufacturing retrieval systems, automated machining cells, flexible centers and computer aided design (CAD). All of these techniques are presently used in Japan, making possible the substitution of labor for capital and higher productivity. A recent International Trade Commission (ITC) study noted that the increasing use of CAD-CAM in machine tool manufacturing was both an important stride forward for the industry and a necessary step in order to increase competitiveness.

- Greater Responsiveness To Customers: The recent National Machine Tool Builders Association (NMTBA) petition seeking import protection notes a number of steps which companies have taken to improve their responsiveness to customers. Notable among these have been increases in the speed of servicing, greater customer training and stricter quality control. In direct response to Japanese firms, some U.S. companies have begun to produce machine tools for inventory.

The continued increase in Japanese imports in spite of these steps by U.S. manufacturers should be of concern to U.S. policy makers. There are no convenient explanations. Despite new products and processes developed by U.S. manufacturers, Japan's share of the machining center and CNC lathe market has increased yearly, and more and more leading U.S. manufacturers are producing their most sophisticated machine tools abroad through cross-licensing agreements. Bendix Automation recently announced that it was transferring production of all its lathe, parts and CNC chucks to Japanese factories. Bendix, Acme Cleveland and Litton all announced in 1983 that they would be marketing Japanese products.

Part of the reason U.S. firms have not been able to turn back the import challenge has been the steep recession in the



U.S. economy. While backorders have slightly cushioned the fall, the overall impact on the industry has been extremely painful. By late 1983 the industry was operating at only 40% of capacity. Most firms reported losses in 1983 and the United States Industrial Outlook predicts that the industry will run at a loss for at least the first half of 1984. The result of these losses and the continued recession has been to delay implementation of some of the firms' most important plans for product development and to weaken manufacturers' ability to obtain capital and attract staff.

#### The Massachusetts Machine Tool Industry

Machine tool manufacturing has historically been important to the Massachusetts economy. As recently as 1942, three of the eleven largest machine tool companies in the U.S. were located in this state and the industry employed over 12,000 Massachusetts residents. Today, however, it is believed that there are less than 2,500 machine tool workers in the state. The only companies of any significance remaining in the state are the Heald division of Cincinnati-Milacron, Warner and Swasey, and Boston Digital (the only independent, locally owned company). Since World War II, Massachusetts has declined from the third to the ninth largest machine tool manufacturing state. Only in the Worcester area does the machine tool industry remain a major employer, where over 2,000 jobs remain.

The decline in the machine tool industry in Massachusetts reflects market changes in its products. Producers of large custom-made machine tools find it convenient to locate near their buyers. Since the 1940s, the automobile industry has become the single largest purchaser of machine tools. This industry is concentrated in the Midwest, which has encouraged machine tool firms to locate in this area. The relative success of Connecticut in retaining its share of the industry is due to ties between that state's machine tool and aerospace industries.

#### The Future: Can The U. S. Maintain A Viable Machine Tool Industry

Whether it is the recession in the U.S., continued MITI assistance to the Japanese industry or other causes, there are reasons to be concerned about the present and future status of the U.S. machine tool industry. The immediate problem was the recession and lack of new orders. Further compounding the industry's problems is the vast number of used machines on the market and extensive price cutting by foreign competitors. Most reports suggest that the Japanese have a year's supply of CNC machine tools in inventory in the U.S. and are willing to sell at considerable discounts. In order to be competitive with these prices, U.S. firms must cut their profit margins considerably. Even assuming that



these problems can be overcome and that demand rebounds, it is questionable how much of the market U.S. firms will take. At present imports account for close to 30% of the U.S. market and there is reason to believe that this proportion will continue to grow.

#### Implications For Massachusetts

In the past few years, Massachusetts firms have shared the problems faced by all U.S. machine tool manufacturers. However, as the analysis indicates, changing markets may also present opportunities. Massachusetts' traditional strength in metalworking industries, coupled with its more recent strength in high technology, could prove to be the basis for success in emerging sectors of machine tools: computer controlled machines, flexible manufacturing systems and robotics. Several of the more innovative firms in these areas are located in Massachusetts. Boston Digital, located in Milford, is one of the few machine tool companies to make all computer controlled equipment. This company is highly respected for the sophistication and quality of its machinery and in fact, Toyota has recently purchased Boston Digital equipment. Automation, another Massachusetts based firm, is one of the nation's leaders in robotics. In addition, a new firm in Lawrence, Massachusetts is experimenting with the use of lasers to cut metal. Although these firms face many constraints (for example, the exchange rate of the dollar has seriously hampered their ability to export and compete with imports), they are potentially an important component in the Commonwealth's continuing economic progress and the future of machine tool manufacturing nationally.

#### THE CUTTING TOOL INDUSTRY

Cutting tool manufacturing is the most important part of the metalworking industry in Massachusetts. It is composed primarily of a handful of large manufacturers of taps, twist drills and dies--the expendable parts used with machine tools.

Cutting tool manufacturing is currently in a state of crisis in Massachusetts. As one industry executive noted, "almost every company (in the industry) in Massachusetts is in a turnaround situation". Within the past year, three of the largest cutting tool plants in the state have been threatened with closing: two are searching for buyers and one is in the midst of a serious labor dispute. Remaining employment in the industry is extremely unstable. However, the factors affecting this industry are very different from those affecting machine tool manufacturers. Given the current status of the industry in Massachusetts, the following analysis of the forces affecting the industry



nationwide and its likely future directions is of particular importance.

Since 1979, the value of shipments of cutting tools has declined 19% in real terms. The recent recession explains only part of that decline. U.S. cutting tool manufacturers are currently facing four sources of change likely to affect their long-term viability:

- changing markets
- changing technologies
- international competition; and
- changing industry structure.

### Changing Markets

Cutting tool products can be divided into two general categories:

- Specials - Those tools which are custom made for a specialized use by one customer and
- Standards - Mass produced tools that are made in standard sizes to fit commonly used equipment.

Most cutting tool manufacturers produce a mix of both special tools and standard tools. Specials are becoming an increasingly important part of the market, currently accounting for over 50% of industry shipments. Since delivery time and service is of particular importance for specials, the shift of major parts of end-use markets, such as aerospace and energy firms, to the South and West has contributed to the shift in cutting tool manufacturing to those areas. Fifteen years ago, 95% of all taps and dies were produced in the Northeast: now, only 35% are still manufactured here. Massachusetts has been affected, as local firms have expanded through satellite plants in the South.

In contrast to the market for specials, the market for standards is increasingly international. Unlike the small tool and die shops making specialized products, manufacturers of standard cutting tools are not tied to local or regional industries. The market is quite price sensitive, thus encouraging foreign manufacture in low-wage nations.

A more important market shift than the movement of end-use markets West and South has been the shift of many metal fabrication industries abroad. More and more parts, particularly in the automobile industry, are produced overseas. As a result, domestic cutting tool manufacturers of both standards and specials are losing their domestic customer base.



### Technological Changes

There are a number of technological forces affecting manufacturing processes which are causing a significant decline in overall demand for cutting tools.

- First, new numerically controlled machine tools have extended the useful life of cutting tools because they operate more efficiently.
- Second, the use of glue rather than metal fasteners has eliminated some need for cutting tools.
- Third, more and more plastic is being used in the manufacturing process. One company noted, for example, that they are now making plastic carburetors. The use of plastics as a substitute for metal further reduces demand for cutting tools.
- Finally, lasers are now being used to cut metal, with the potential to transform the entire metal cutting process and eliminate the need for cutting tools.

Over time there have also been significant improvements in the materials used in cutting tools. These materials increase the durability of the tools and thus extend tool life. New titanium nitride coatings applied to cutting tools result in gains in tool life from 50% to more than 300%. High performance ceramic materials and synthetic diamonds are being developed for high volume metal cutting applications to replace carbide and high speed steel.

Because of the competitive nature of the industry these improvements in the life of the tools have not met with a corresponding increase in the price of cutting tools. This further erodes the profit margin of cutting tool companies.

### International Competition

Imports of cutting tools into the U.S. have increased dramatically since 1967. In 1972 \$17 million of imported cutting tools entered the U.S. By 1982 the value of imports of cutting tools had increased to about \$112 million, and this rate of increase is continuing. In the first six months of 1983 imports were valued at \$66 million, about 27% higher than the same period in 1982. The value of cutting tool exports has not kept up with the rise in imports. Since 1978 the U.S. has had a negative trade balance in cutting tools (Exhibit 9).



Major sources of imports are Japan, West Germany, Spain and France. Together these countries account for about 59% of imports. Other countries in the process of gaining U.S. market share include Yugoslavia, Israel, Poland and China.

Imports pose a more serious problem for standards than specials. Standard cutting tools can be mass produced and are much more cost sensitive. The advantage the U.S. held in the quality of the product is no longer as great. In the future it is likely that low wage producers will increasingly enter the U.S. market with quality products at lower prices.

Although rising at an extremely fast rate, imports still account for a relatively small portion of cutting tool consumption. Import penetration has increased from about 2% in 1972 to 5% in 1982 (Exhibit 10). Recent industry estimates show imports accounting for closer to 6% to 7% of the U.S. market. There are signs that imports are likely to continue to grow dramatically.

Foreign countries are currently establishing a strong position in the U.S. market. Industry experts note that the primary reason import penetration is still relatively low is that the industry has not yet been targeted as in the case of the Japanese with machine tools; however, one large Japanese company has recently established reciprocal trade agreements with General Motors and one large Japanese manufacturer has recently purchased a facility in Massachusetts to gain access to distribution networks. Imports from Japan, Yugoslavia, Israel and Poland are entering the U.S. duty free because of those nations' preferred trading status. These trends are signs that foreign competitors are likely to pose a more serious threat to the U.S. industry in the future.

On the export side, U.S. firms have not actively pursued foreign markets. The primary obstacle is the value of the dollar. However, other forces have constrained the ability of U.S. manufacturers to compete internationally. Most nations, including European countries, use the metric system as the standard for cutting tools. Thus, to meet foreign specifications, a U.S. manufacturer would have to produce a separate set of tools. Few U.S. companies have made the necessary investments. In addition, many cutting tool companies, especially the smaller ones, do not know how to enter foreign markets. To address some of these problems, the Cutting Tool Manufacturers Association recently set up special seminars on U.S. export programs.

#### Industry Structure

There are approximately 20 large cutting tool companies in the U.S. Most of the companies in the industry employ less than 100 workers. Until the mid 1960s the tap and die



market was dominated by large, independently owned manufacturers controlling 65% of the market. Four Massachusetts companies dominated this group. By the late 1970s a majority of these companies had been taken over by large conglomerates. In Massachusetts Gulf & Western bought Morse Tools, Litton Industries bought Union Butterfield, Bendix (now Allied) bought Threadover, TRW bought Greenfield Tap and Die, and Acme Cleveland bought Bay State Tap and Die.

There is a mixed view on the effects of the loss of independence of many of the larger traditional companies. Many observers have noted that some of the older firms were "harvested" by their corporate parents. The conglomerates did not make needed investments in technology, equipment, product changes and marketing. Conglomerate owners also were impatient with their subsidiaries during recessions. The result was a significant drop in the ability of these plants to compete. Some companies did, however, benefit from conglomerate ownership. In one case, a large conglomerate has invested between \$7 and \$8 million in new equipment in its Massachusetts subsidiary. This company has been one of the few to maintain market share over the past decade.

Currently many conglomerate owners, recognizing poor industry-wide trends and low profit margins, are looking to divest their cutting tool subsidiaries. In Massachusetts at least two companies are actively looking for new owners. Given current market conditions and the age of the plants and equipment, the future of many of these facilities is in question. It is likely that parent companies will face difficulties in locating new owners for these businesses.

#### Successful Company Characteristics

The trends affecting cutting tools in the U.S. suggest that a major shakeout is likely. With excess capacity both nationally and internationally, companies cannot afford to lose market share. Any price cut must be matched, resulting in further erosion of profit margins. Not all companies will be able to survive.

Given the serious changes in the industry, however, many companies have been able to adjust and develop strategies which have proven successful. For many, the primary strategy has been diversification. This has taken the form of entering the consumer market or developing new but related products. Others have changed their mix of standards and specials, by concentrating more on the specials market which is less vulnerable to foreign competition and is less price sensitive.

Other successful companies have picked a small "niche" and specialize in particular tools which are at a different development stage. As an example of a "niche" strategy, one



small U.S. company decided to focus on metric tools and has been very successful.

A final strategy that is being pursued, though there are many problems associated with it, is to greatly increase productivity. Because of product price sensitivity and low growth projections, the only way to maintain a profitable operation becomes increasing productivity while maintaining market share. A few firms are seeking to make significant investments in new capital equipment to improve their production processes.

#### The Cutting Tool Business In Massachusetts

Massachusetts companies have been seriously affected by all of the forces discussed earlier. Average firm size in the state is relatively high: the business in the state is dominated by less than 10 major manufacturers. Few independent companies remain in the state.

Massachusetts firms have contracted significantly over the past 5 years. No major company has been immune from the problems of the industry and large scale layoffs have been common. These layoffs have hit especially the New Bedford, Greenfield, and Athol areas. With few plants shutting down entirely, cutting tool manufacturers in the state have been operating with significant excess capacity.

Labor force problems have hit Massachusetts companies particularly hard. Almost every major company has experienced a serious labor dispute, if not a protracted strike, in the past few years.

As discussed, the trend has been for firms to move south and west. Over the past 5 years, Massachusetts has lost its dominant position in the industry. The state's share of U.S. employment has dropped from 13% to 10% between 1965 and 1982. If new owners are not found for the Morse Tool and Bendix plants and the labor dispute at Union-Butterfield is not resolved, it is likely that Massachusetts' position in the industry will be further eroded.

In addition to the general forces affecting the industry, Massachusetts cutting tool manufacturers face other problems as well. For a few companies, their conglomerate parent did not make needed investments in capital equipment and plant maintenance during the industry's good years. They are operating with inefficient equipment in out-dated plants. Current economic conditions in the industry make it more difficult to make the types of investments needed to improve productivity.

Companies concerned with maintaining or increasing productivity note that they have been constrained by outdated



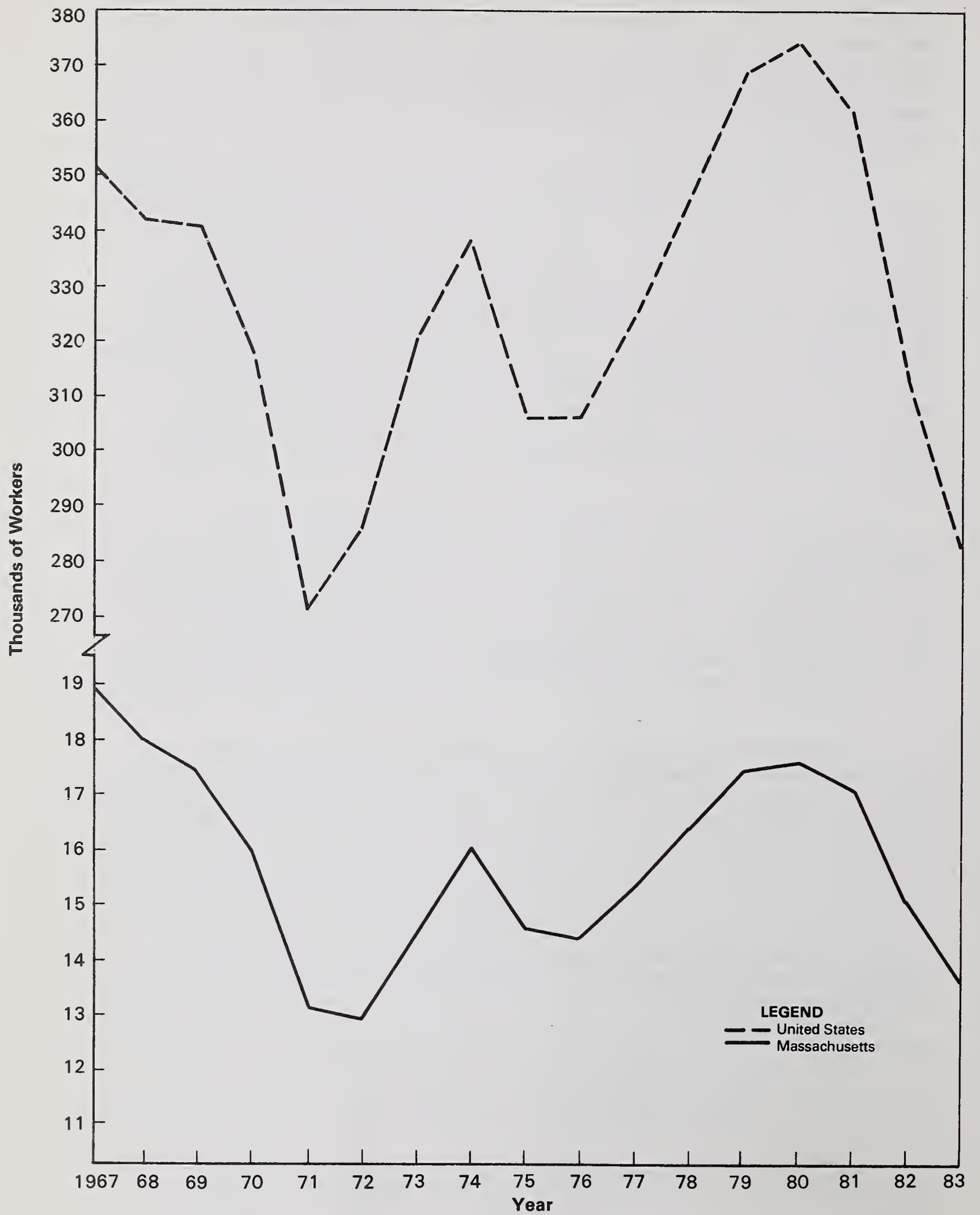
union workrules. Companies willing to invest in new equipment face problems around who can operate the machines and how incentive packages have been designed. Most in the industry acknowledged that the move to the South was in large part motivated by the need for increased flexibility, not wage levels.

Many of the state's cutting tool manufacturers were also concerned with the high cost of energy in the state and with problems in training workers on new machines. Some need workers with electronics skills who are able to operate computerized equipment. There was a general view among manufacturers that the existing vocational educational and training system in the state was not meeting this need. As one example, a Massachusetts firm noted that it needed around 20 workers with training on new equipment. It had hoped to retrain some recently laidoff workers. Yet the only equipment which the local vocational school had was the obsolete equipment that the company had donated. Both the Midwest and the South were said to have much better training capabilities.

It is clear that there will be a continuation of employment loss in the cutting tool industry in Massachusetts. The loss will be due to the further shakeout in the industry and to technological changes in the companies that do survive. Fewer skilled workers will be needed and the type of skills called for will involve retraining. Many highly skilled metalworking machine operators and machinists are likely to face dim prospects of finding comparable work at a comparable pay scale.

Greater involvement of employees in the management of the production process may be able to alleviate some of the more pressing workrule issues. A targeted retraining program may be able to improve the employment prospects in the industry and make Massachusetts more competitive with other states as a future location for the cutting tool industry. Finally, active efforts must be made to locate new owners for facilities that are currently being divested by their parent corporation. Specialized retraining, energy conservation, financing packages and export programs targeted to the industry may be effective means of retaining employment and attracting new owners.

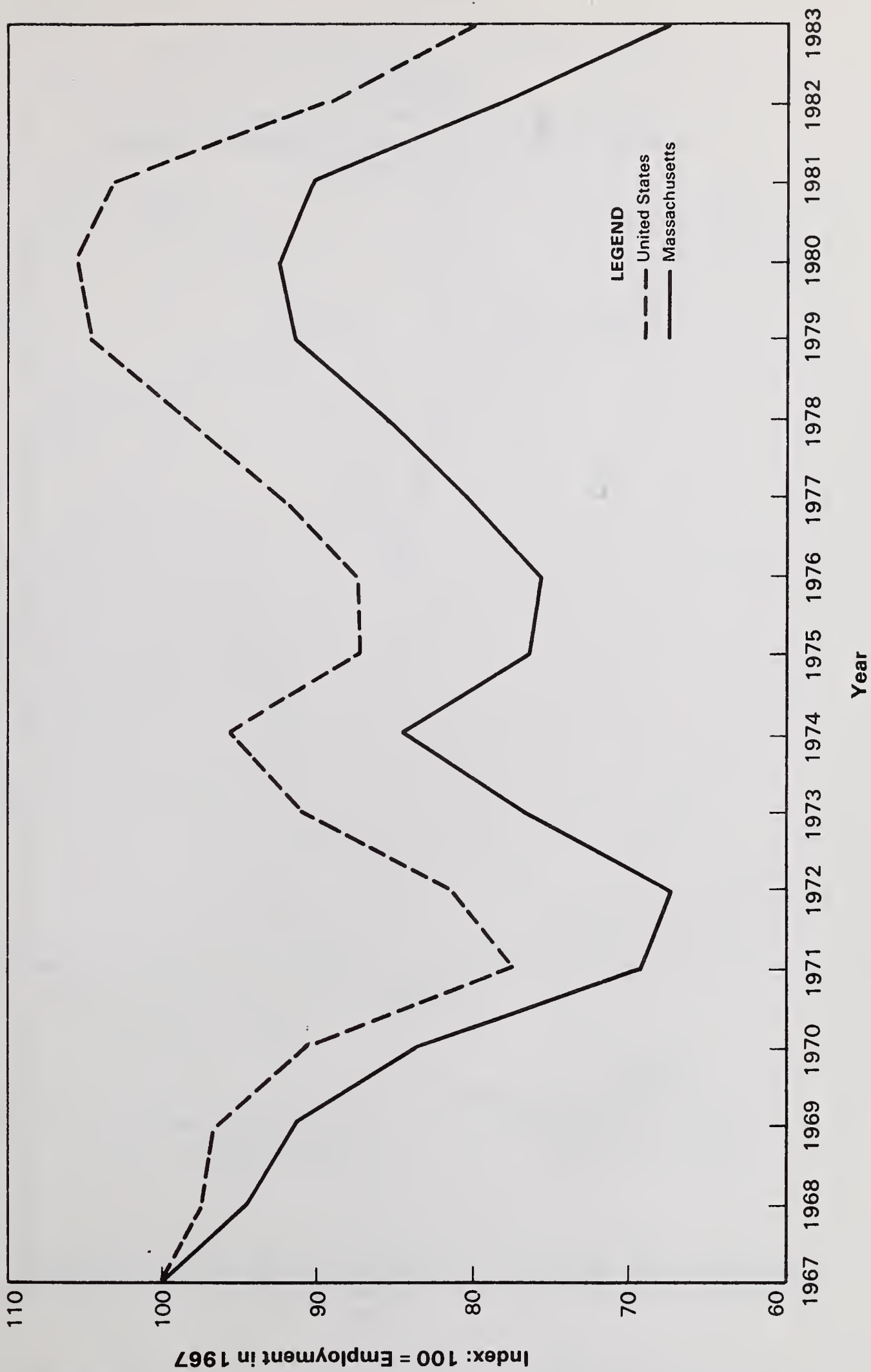
**EXHIBIT 1**  
**Employment in Metalworking Machinery**



Source: United States Department of Labor, Bureau of Labor Statistics

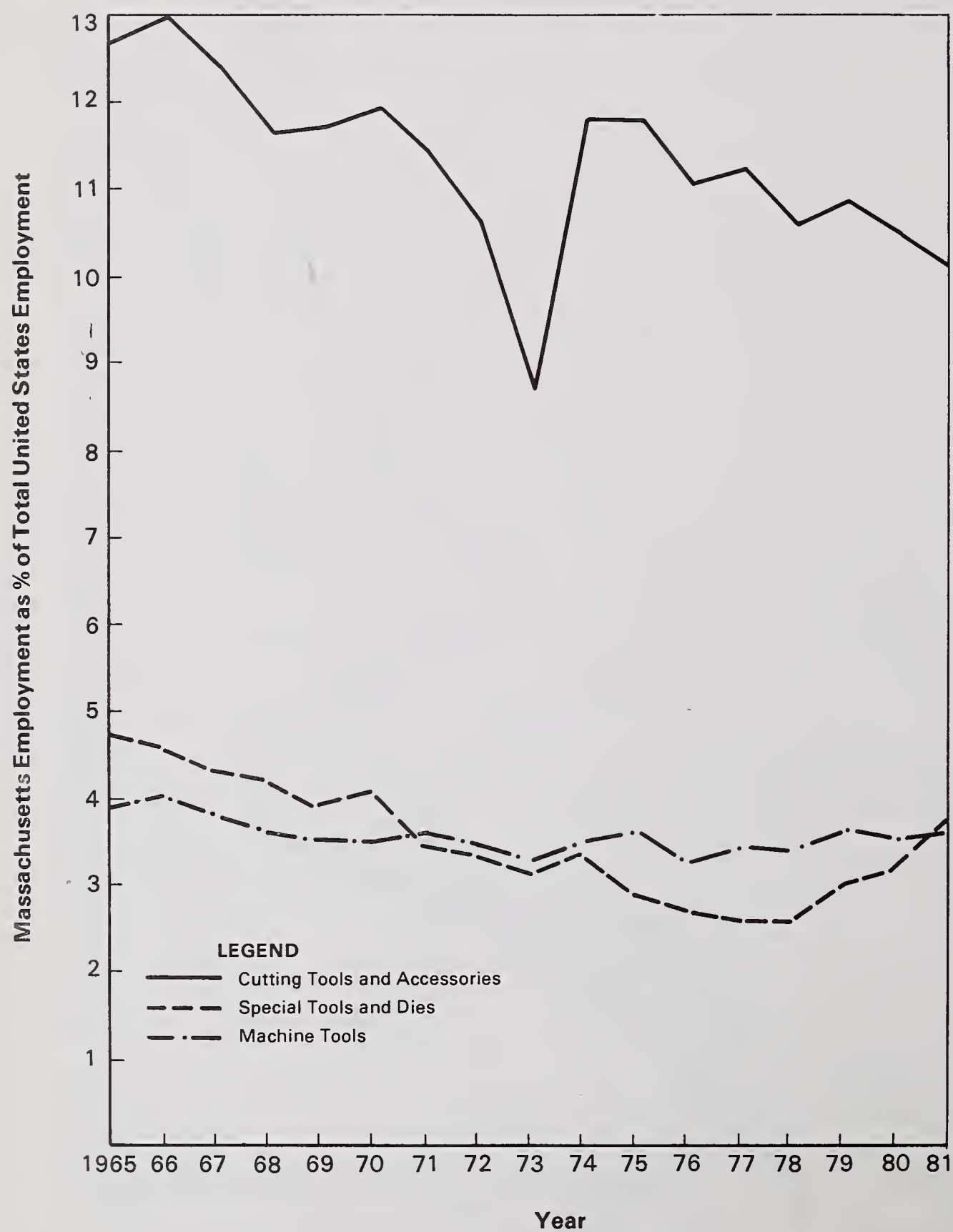


# EXHIBIT 2 United States and Massachusetts Employment in Metal Working Machinery



Source: United States Department of Labor, Bureau of Labor Statistics

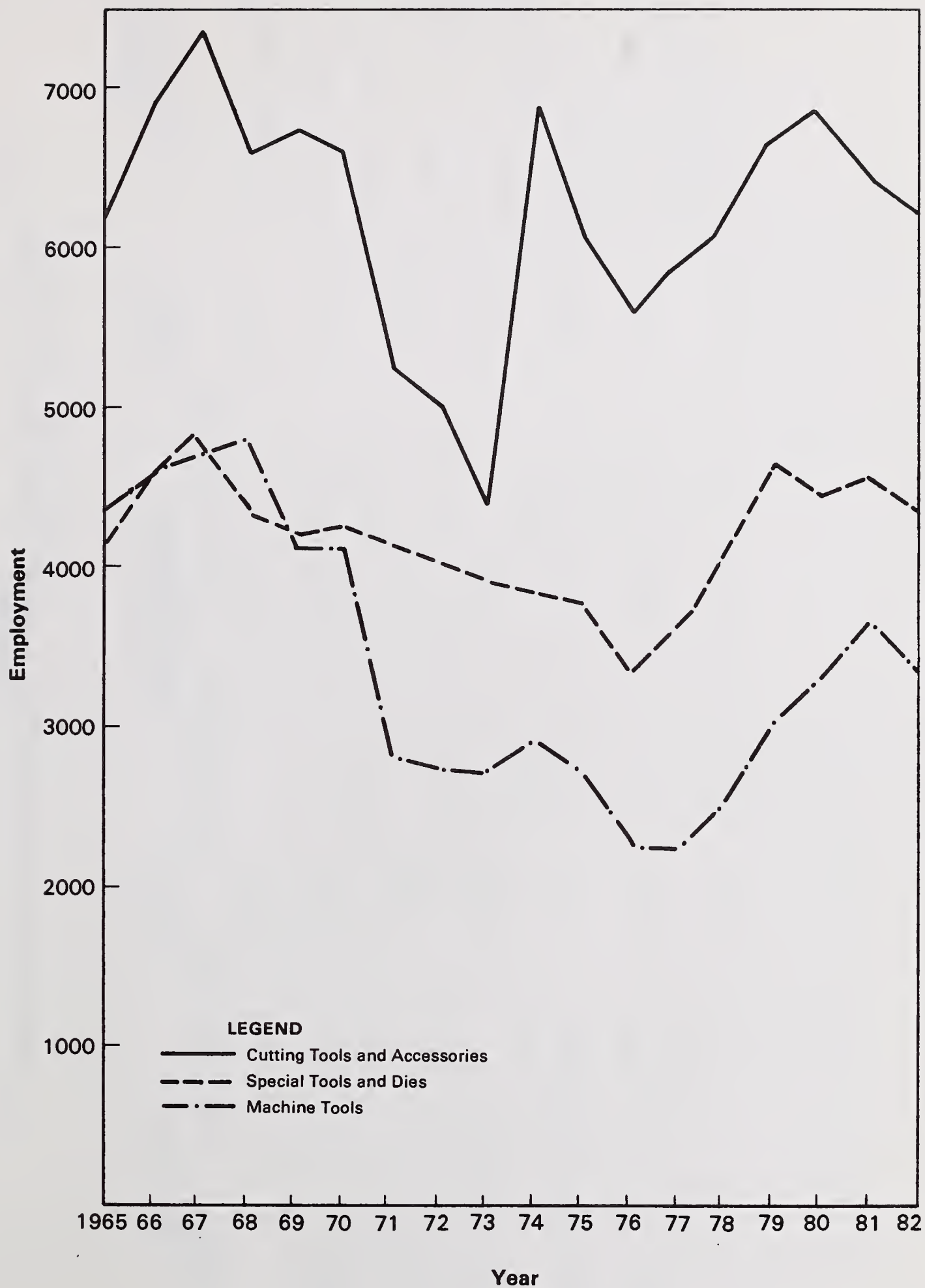
**EXHIBIT 3**  
**Share of United States Employment in the**  
**Massachusetts' Metalworking Machinery Industry**  
**by Major Segment**



Source: United States Department of Commerce, Bureau of the Census: County Business Patterns



**EXHIBIT 4**  
**Massachusetts Employment in the**  
**Metalworking Machinery Industry by Segment**



Source: United States Department of Commerce, Bureau of the Census: County Business Patterns

**EXHIBIT 5**  
**Metalworking Machinery Industry: United States and Massachusetts**

<u>SIC</u>		<u>UNITED STATES</u>		<u>MASSACHUSETTS</u>	
		<u>TOTAL EMPLOYMENT</u>	<u>PERCENT OF TOTAL EMPLOYMENT</u>	<u>TOTAL EMPLOYMENT</u>	<u>PERCENT OF TOTAL EMPLOYMENT</u>
354	METALWORKING MACHINERY	348,417		17,072	
3541	Machine Tools, Metal Cutting	74,589	21.4%	3,164	18.5%
3542	Machine Tools, Metal Forming	26,676	7.7%	476	2.8%
3544	Special Dies, Tools, Jigs, Fixtures	125,736	36.1%	4,558	26.7%
3545	Machine Tool Accessories, Cutting Tools	63,102	18.1%	6,385	37.4%
3546	Power Driven Hand Tools	28,617	8.2%	850	5.0%
3547	Rolling Mill Machinery	7,119	2.0%	850	5.0%
3549	Metalworking Machinery, Not Elsewhere Classified	<u>21,940</u>	<u>6.3%</u>	<u>716</u>	<u>4.2%</u>
	TOTALS	347,779	100.0%	16,999	99.6%

Numbers may not sum due to rounding.

Source: United States Department of Commerce, Bureau of the Census, County Business Patterns

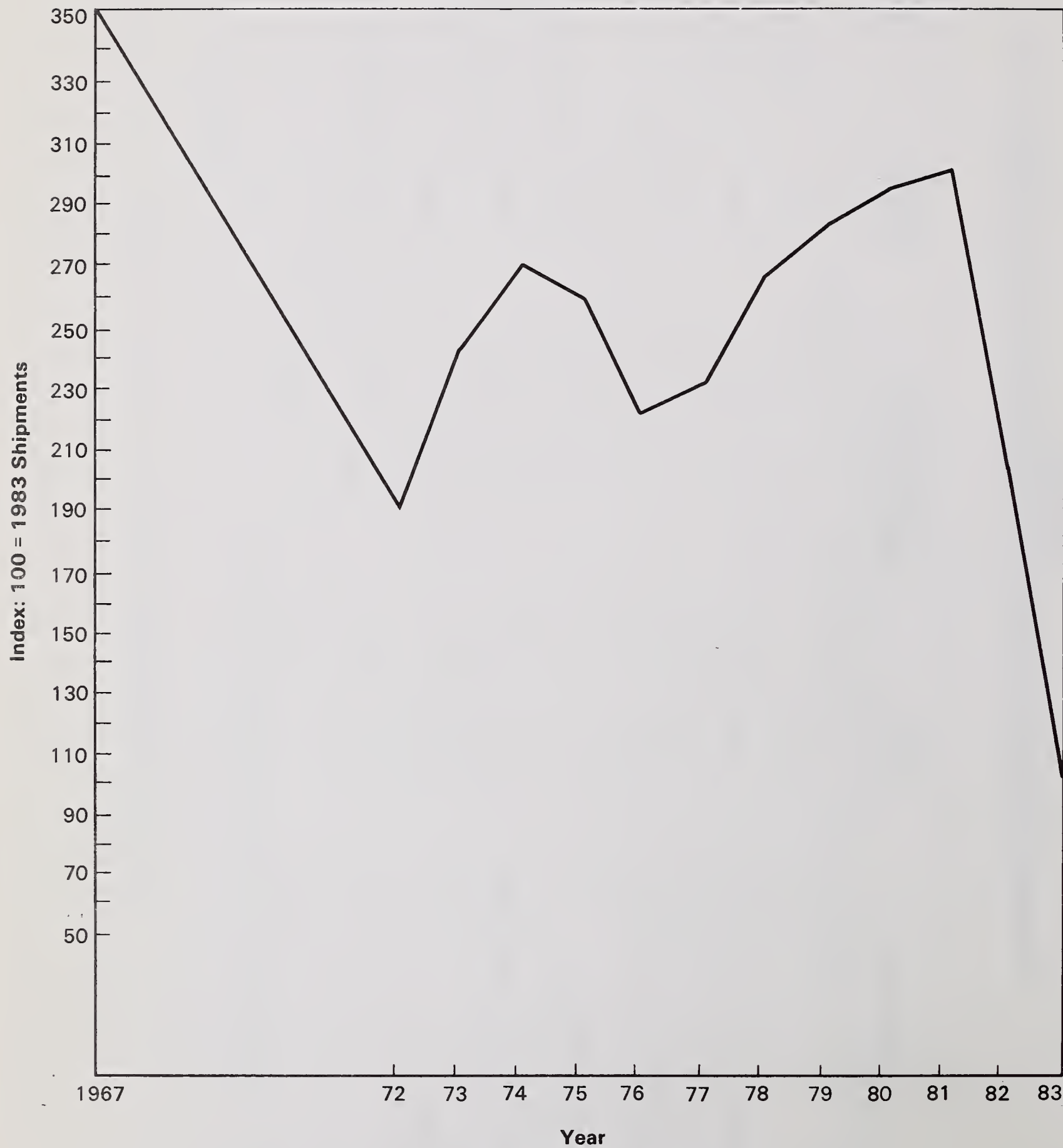


**EXHIBIT 6**  
**Geographic Distribution of Metalworking Machinery Industry in Massachusetts**

<u>LMA</u>	<u>1980 EMPLOYMENT</u>	<u>THIRD QUARTER 1983 EMPLOYMENT</u>	<u>PERCENT CHANGE</u>	<u>1983 METALWORKING EMPLOYMENT AS PERCENT OF TOTAL LMA EMPLOYMENT</u>
Athol	2,625	1,838	-30.0%	26.0%
Greenfield	1,594	644	-60.0%	3.7%
Southbridge	441	416	- 5.6%	3.5%
Fitchburg-Leominster	1,345	941	-30.0%	2.5%
Springfield-Chicopee-Holyoke	2,011	1,687	-16.0%	.8%
Worcester	4,413	3,182	-28.0%	2.0%
Boston	2,721	2,549	- 6.3%	.2%

Source: Massachusetts Division of Employment Security

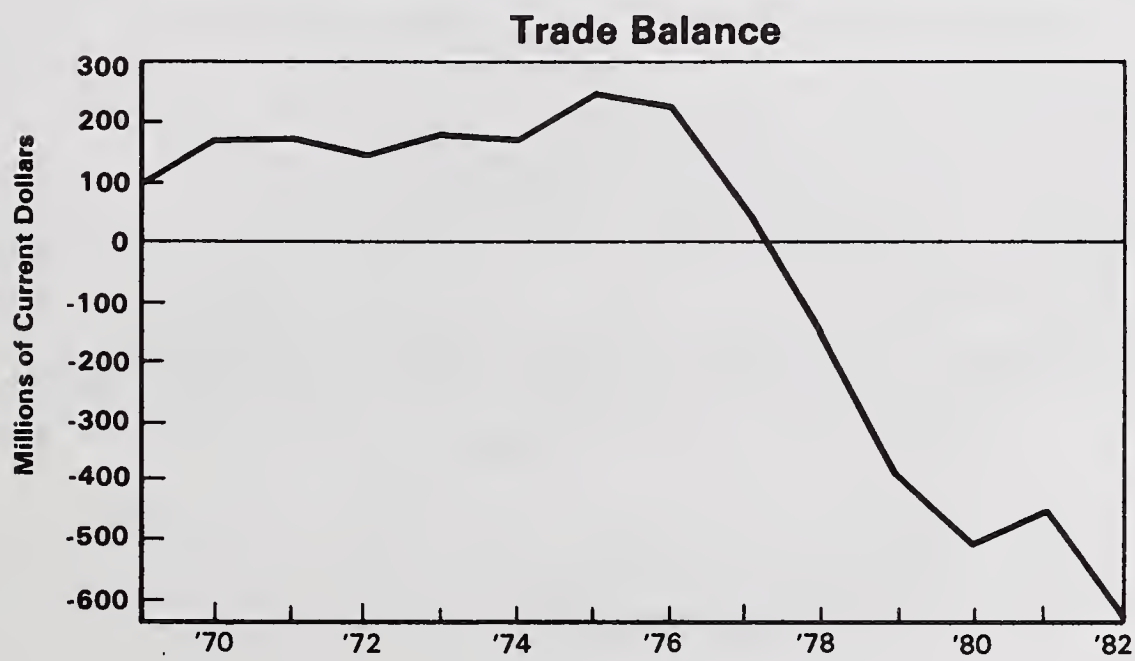
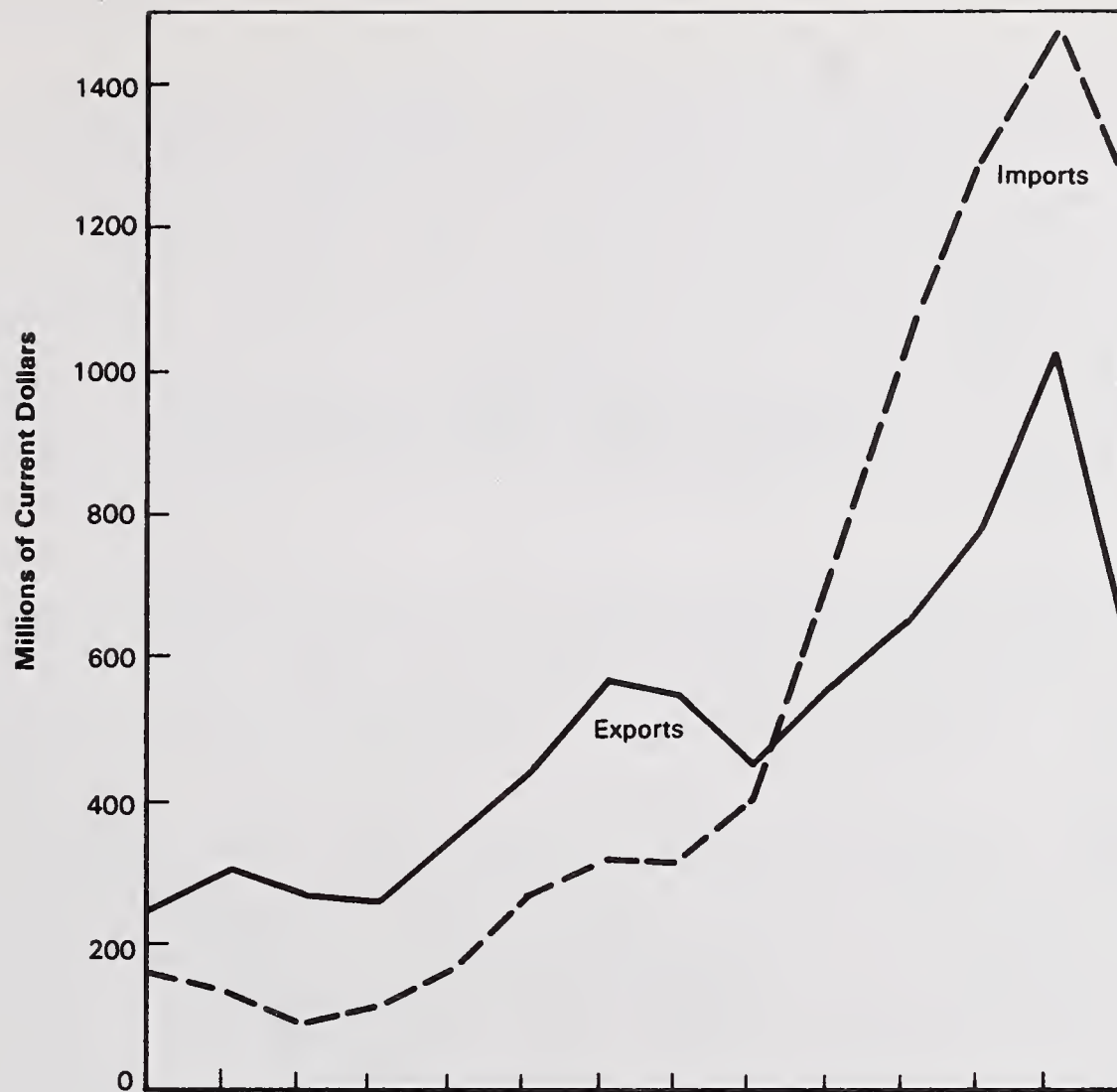
**EXHIBIT 7**  
**United States Machine Tool Shipments**



Source: United States Department of Commerce: U.S. Industrial Outlook

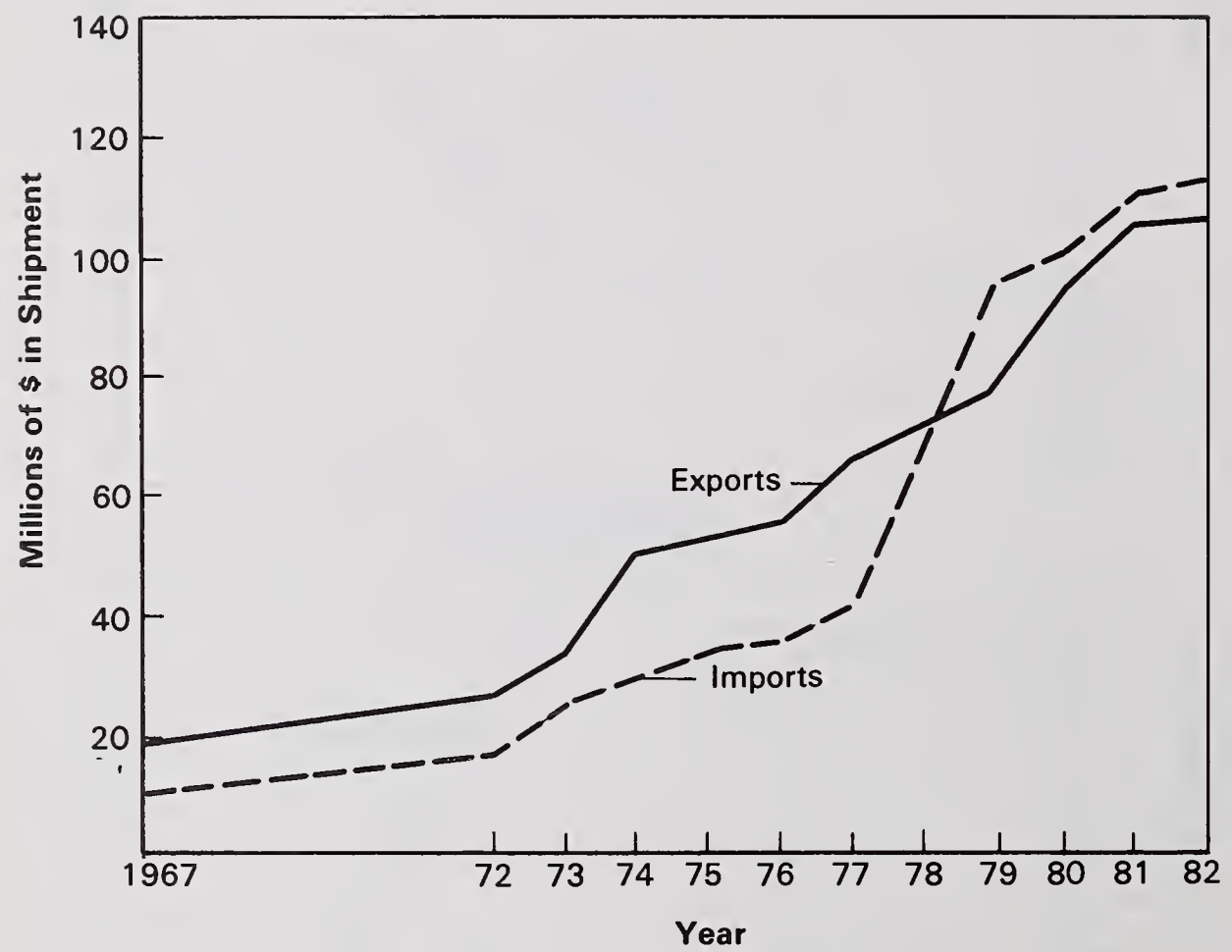


# **EXHIBIT 8** **Machine Tools** **Imports and Exports**



Source: American Machine Tool Association

**EXHIBIT 9**  
**Cutting Tools: Imports and Exports**



Source: United States Department of Commerce



## THE SHOE INDUSTRY

### INTRODUCTION

The story of the U.S. shoe industry is a classic case of a labor-intensive business exposed to competition from low wage countries. While new production technologies have offered larger companies some opportunity to reduce labor costs, they have not been enough to keep U.S. production competitive. Unlike the garment industry, which has had significant trade protection, the U.S. shoe industry has had virtually no tariffs or quotas to guard its home market. As a result, import penetration has been severe. In spite of a relatively stable market in recent years, imports have grown from less than 8% to over 60% between 1960 and 1983 (Exhibits 1 and 2).

The greatest volume of imports has come from low wage countries, but Italy, with wage levels approaching those of the U.S., also holds significant market share based more upon style and quality than price (Exhibits 3 and 4).

Imports have historically been greatest in women's shoes, with their lower prices and lower quality standards. Athletic shoes, the one portion of the U.S. market that has shown significant growth in recent years, have also been adversely affected by imports (Exhibit 5). Import penetration has generally been heaviest at the lower price end of the market (Exhibit 6). Three factors contribute to this trend. Low wage countries are not yet able to produce the quality levels required in higher-priced shoes. In addition, foreign manufacturers have concentrated on high volume markets which are usually lower priced segments. Also, they concentrate on a relatively narrow range of foot sizes that make up the majority of demand (Exhibit 7). By doing this, they minimize their investment in patterns, dies and lasts (forms around which shoes are made), all of which must be unique for each shoe size and for major pattern types. As a result, they tend to produce a narrower range of foot sizes than American companies. Size range is an important selling point in higher-priced shoes.

Imports have, however, been moving into higher-priced shoes as Exhibit 8 suggests. Over time, developing countries have improved the quality of their production, enabling them to move into these higher-priced segments.

While distribution can act as a barrier to imports in some product categories, this is not true in shoes. With mass merchandisers like Sears and K-Mart and shoe chains like Thom McAn, large sophisticated retailers provide relatively easy market access for imported shoes.



Some shoe manufacturers like Stride Rite also have distribution businesses. This would seem to allow them to "protect" outlets for their domestic production. When imports are available at appropriate price/quality levels however, these manufacturers will import those parts of their product line, as will manufacturers that are not forward integrated. One Massachusetts manufacturer displays two casual shoes that are identical in appearance and quality. One was imported from Spain at a landed price of \$11.00. The Massachusetts-made shoe cost \$16.50. At retail, that represents a price difference of \$15.00: a \$25.00 selling price for the import and \$40.00 for the Massachusetts shoe.

Many U.S. shoe companies have phased out either all or most of their U.S. production facilities. Melville/Thom McAn for example, once had 21 U.S. factories. Currently, they have one.

In addition to the import of finished shoes, many shoe components, most notably the uppers, or top parts of the shoe, are also imported. These are the most labor-intensive parts of the shoe and are imported with no tariffs or quotas. A company will often import the upper and assemble the rest of the shoe domestically.

As mentioned earlier, the shoe industry has had virtually no trade protection. Orderly Marketing Agreements in effect between 1977 and 1981 placed limits on the pairs of shoes which could be exported from Taiwan and Korea. Currently, there is only an 8.7% trade-weighted average tariff on imports. Shoe industry people argue that many countries not only have wage rates that are unacceptably low by our standards, but that foreign governments often subsidize their shoe manufacturers because they are important exporters and domestic employers. In addition, they protect their own markets with extraordinarily high tariff and non-tariff barriers such as quotas, embargoes and licensing restrictions. Exporting from the U.S., therefore, becomes extremely difficult.

Successful U.S. shoe companies generally follow some combination of the following tactics:

- market aggressively with an emphasis on design
- import when costs so dictate
- serve a segment that is too small for importers to be interested in, such as golf or safety shoes
- focus on very high quality shoes which are labor intensive but where the final cost of the shoe is high enough to cover wages



- compete on the basis of quick delivery and the ability to service specialized needs of the customer
- automate production as much as possible and focus on specific segments of the industry to be able to recognize scale economies; and
- develop their own retail outlets and/or brand name.

The extent to which such tactics will be successful in the future remains open to question. To some extent, an important determinant will be major retailers' desire to retain domestic suppliers. Importing is not without its risks.

Many shoe companies that have developed import programs or have developed retailing operations are relatively profitable, especially when compared to apparel manufacturers. This factor has made it difficult for the industry to justify trade protection at the national level. The shoe industry exemplifies a situation where companies remain profitable and in business but where many production jobs will be lost.

The effect of imports, combined with improvements in labor productivity and consolidation within the industry, has resulted in an employment drop in the footwear and related products industry of from approximately 300,000 jobs in the early 1970s to 221,000 in 1982 (Exhibit 9). The actual job loss in the U.S. due to shoe imports is probably greater. The shoe industry is the end-user for shoe-making equipment, plastic parts and textile products. These figures do not reflect employment losses in these supplier sectors.

#### Technology In The Shoe Industry

The shoe industry, like the garment industry, has traditionally been a labor-intensive sector. The number of styles and sizes and the flexibility of the materials (leather, synthetics and fabric) make it difficult to adopt new production technologies. Automating production is further complicated by the number of steps in the process. A high quality men's shoe can have as many as 80 separate operations.

Control systems and handling devices, available for the past 20 years, have until recently been unable to meet the demands of the shoe industry. Now, the development of microcomputer technology at acceptable cost levels has been applied to varying shoe production tasks.

Computer-aided design and manufacturing (CAD-CAM), robotics and new methods for cutting materials are now available to manufacturers. Particularly in stitching operations, cost levels and reliability have put these new processes within reach of more and more manufacturers. Such new technologies have many potential benefits from a manufacturer's perspective:

- "de-skilling" of operations reduces training time from six months to about a week
- increases of productivity of 60% to 300% by some estimates; and
- improved and consistent quality.

CAD-CAM was first applied to fancy stitching, particularly in cowboy boots. Later came "join and sew" operations for soft athletic shoes. Three-dimensional sewing is the next horizon.

While these new technologies can be applied to specific steps in shoemaking, a system-wide approach which combines several steps is more promising. A major technology study of the industry conducted by the Footwear Industries of America (FIA) identified the following areas (which combine several manufacturing operations) as the industry priorities for new technology development:

- functional stitching or joining of parts
- cement-bottom attaching (rough, cement, activate, spot and press)
- lasting (toe, side and heel joining of the upper to the lower part of the shoe)
- cutting of leather, especially uppers; and
- injection molding.

The systems priorities targeted by the FIA study for the development of equipment and/or techniques that small and medium-size companies can afford include:

- computer-aided design, engineering and manufacturing
- production planning and in-process control; and
- materials requirements planning.

In the U.S., research and development efforts have traditionally been undertaken by the equipment suppliers. In



Great Britain, France and Germany, the government has committed serious funding to such efforts. In the U.S., the federal government was instrumental in the founding of the American Shoe Center, a research facility later incorporated into the FIA, but this association is in only the first stages of identifying the technology needs of the industry. This is a crucial first step, but currently, the U.S. lags behind other nations in developing an industry-specific program.

Advancements have been made domestically, however there are problems in getting the industry to adopt them. CAD-CAM has been too costly an investment for any but the largest manufacturers. In order for a CAD-CAM grader to be cost-effective, the manufacturer has to be producing an extremely large number of new and different styles. One Massachusetts company said the least expensive CAD-CAM grader which can adjust a pattern to the wide range of foot sizes needed for a full line costs \$120,000. Even though this company manufactures over one million pairs of shoes a year, it is too small for such an investment to make sense. They estimate that they would have to double the number of styles in order for a CAD-CAM grader to be cost-justified.

The same company estimated the cost of an automated stitcher to be about \$7,000 per machine with a three to four year payback. While such an investment is within the range of smaller companies, the future for manufacturing in this country is so bleak, that many companies consider four years too long a payback period.

In summary, new generations of production technology are now available to shoe companies. In some cases, the cost is too great, the payback too long and the capacity too large for an investment to make sense for a business. There are however, examples of companies combining resources to enable individual businesses to take advantage of updated equipment. In Canada, a group of nine shoe manufacturers formed a company to buy and operate a CAD-CAM grader which individual companies can use. Located on the "neutral ground" of a local college, the equipment is currently used by 14 companies. Each company can get a minimum of two patterns graded per day. The Canadian government made a low-cost loan for the equipment purchase. Massachusetts manufacturers have mentioned such a way of "sharing" equipment as a means for them to take advantage of technological advancements.

### Labor Issues

The shoe industry has historically been a low-wage industry. The workforce is often a mixture of older workers who have been with the company most of their working lives, and younger workers who tend to have relatively short tenures. They will often move on to higher-paying jobs.



Several Massachusetts companies have mentioned their concern with the loss of older, higher skilled workers. They see technology as a way to substitute for these skills. One Massachusetts manufacturer mentioned that they were losing younger workers to high tech firms locating in the area. After a while, though, they found some of those workers returning because this shoe company could provide more stable employment than the high tech firms, which were experiencing layoffs. It is likely however, that shoe firms will find it more and more difficult to compete for workers as new companies in the area bid up local wage rates.

#### THE MASSACHUSETTS SHOE INDUSTRY

Massachusetts currently represents 8.5% of employment in the shoe and 12.6% of employment in the leather industries in the U.S. It was the major shoe producing area of the country as far back as the Civil War. For over 100 years, Massachusetts was the most important footwear producing state. Brockton was known as Shoe City, and much of the remaining industry is still in the Brockton area. Exhibit 10 shows the regional distribution of jobs in the shoe industry. The Boston, Brockton and Lawrence/Haverhill labor market areas are where the majority of shoe companies are located. Historically, men's shoes were produced south of Boston and women's shoes north of Boston.

Statewide, shoes (leather and leather products) represent only 3% of manufacturing employment. However, the industry is still important to the regional economies of Brockton--representing almost 20% of manufacturing jobs there--and Lawrence/Haverhill--accounting for almost 10% of manufacturing employment in that area.

Massachusetts is also home to many suppliers to the shoe industry. At the 1983 national "Shoe Tech" trade convention sponsored by the FIA, 67 out of 112 exhibitors were from Massachusetts. They are in several sectors: machinery, textiles, leather, plastics and wood products. The issue of manufacturers. While there used to be 30 suppliers of lasts, there are now three. One Massachusetts manufacturer said he can get molds delivered from Spain quicker than he can get them made and delivered domestically. In a business where style requires a quick response to the market, such factors can be important in determining the competitiveness of domestic manufacturers.

The Massachusetts shoe industry has contracted more than the U.S. industry overall. Between 1972 and 1982, state employment dropped from over 30,000 to under 19,000 a decline of almost 40% (Exhibit 9). Nationwide during the same period, the drop was 21%. In 1969, Massachusetts was second



only to Pennsylvania in the size of its shoe industry. By 1981, Massachusetts ranked fifth among the states.

It is difficult to determine precisely why Massachusetts has suffered disproportionately. It may be because shoe companies here are not typically part of large shoe conglomerates such as U.S. Shoe or Brown Shoe. Size is becoming important in the industry. Smaller firms cannot support the marketing costs involved in keeping up with the latest styles, or justify the investment in new technologies which can reduce manufacturing costs.

The 1982 Directory of Shoe Manufacturers, Wholesalers and Importers compiled by "Footwear News" lists 62 Massachusetts firms. Of these, over one-half are either importers or importers and manufacturers. Some manufacturers tied closely to their communities are seriously trying to maintain their Massachusetts operations. One Massachusetts manufacturer importing one-half of his volume was adamant on his desire to continue manufacturing in the state. "Massachusetts is home base."

Several Massachusetts firms are following a combination of the "tactics" for the industry mentioned earlier. High-priced men's shoes, golf shoes, baby and children's shoes are segments of the industry represented within the state. One company makes at least two trips to Europe yearly in order to keep up on the latest style trends. It is often one of the first to offer new styles. Unfortunately, styling is easily copied by foreign manufacturers and this company feels it is doing the marketing and design work for its foreign competition. It must continually upgrade its line to stay ahead of imports.

The range of companies and the strategies they follow is great. One manufacturer makes high-priced men's shoes in a facility that has not changed greatly in thirty years. The average age of its workforce is 42, down from 49 a few years ago. With its workforce of 350, it turns out 220,000 pairs yearly. The quality levels of the shoes require considerable workmanship and labor.

Another company making men's and women's casual shoes turns out over one million pairs per year with a workforce of 375. The facility is relatively new. There are automated stitchers, and many parts of the uppers are molded together with specialized equipment rather than sewn. The majority of the shoes are made with synthetic materials rather than leather. This means that multiple layers of material can be cut at once. (Leather must be cut skin by skin, since each hide is different.) Even so, this company has a facility in western Europe which can turn out much of its U.S. product line at lower cost and comparable quality.



## POLICY IMPLICATIONS

The shoe industry, while not a major statewide source of employment, is key to the economies of certain regions of the state. As imports increase, not only will manufacturers find it difficult to maintain manufacturing facilities domestically, but supplier industries will also suffer.

Technology offers one way in which companies can stem the impact of low wage competition. However, Massachusetts companies seem to be too small to take advantage of much of the new equipment. One option for the state to consider is to act as a catalyst for companies to jointly access equipment which can be shared. CAD-CAM grading equipment is one example where a joint effort seems promising.

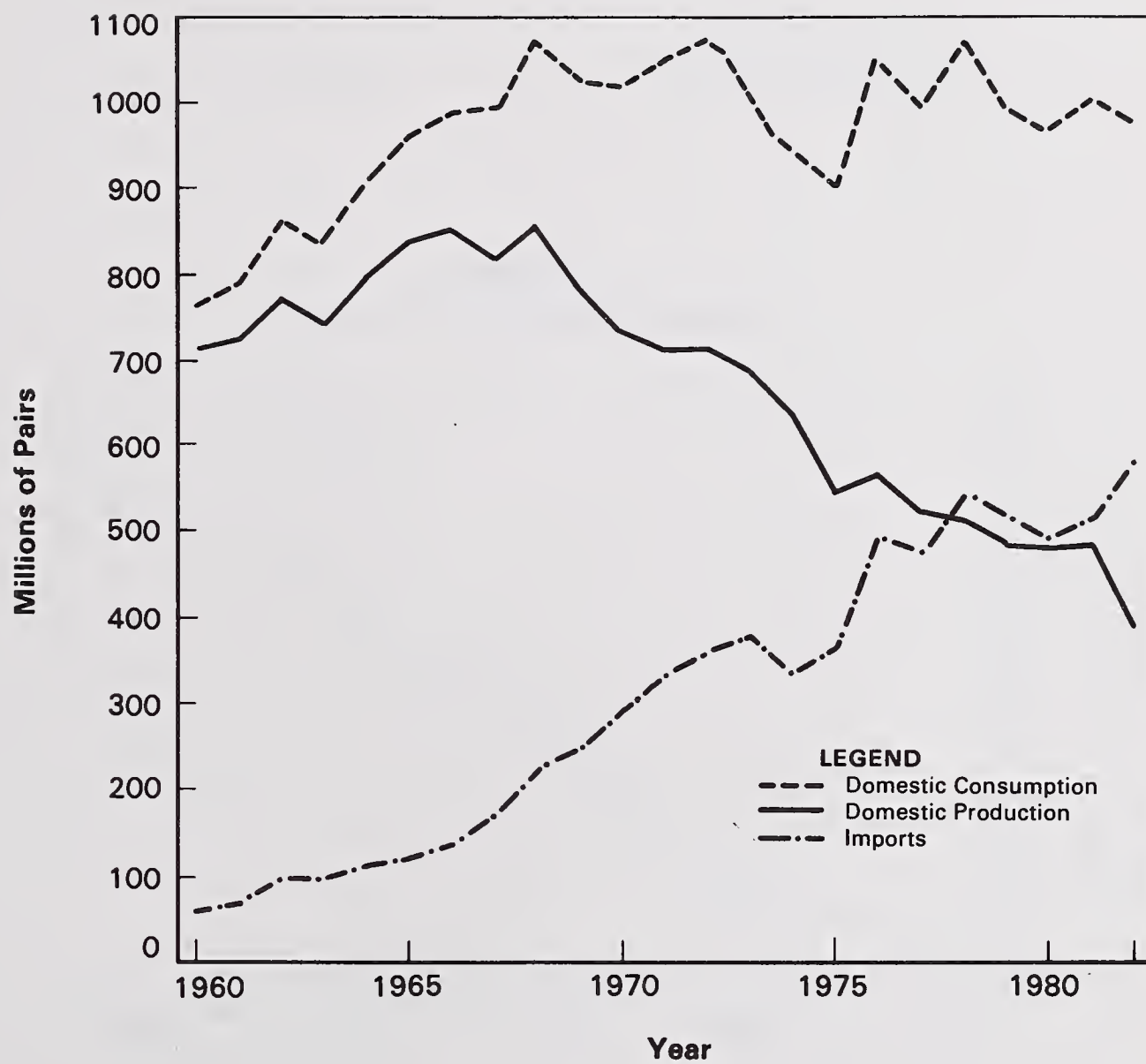
Prior to the Lynn fire of 1981, several shoe companies had planned to move into a mill building in order to share overhead expenses. The fire eliminated this opportunity. Perhaps there are other situations in which shared facilities could offer reduced operating costs to smaller companies.

The state must be sensitive to legislation which unduly impacts industries. For example, a number of tanneries in the Salem area are facing serious problems due to new environmental rulings which are affecting disposal of waste material. For a shoe company, a new law covering elevators and lifts means a \$100,000 investment to convert one freight elevator. This company will have to close off its second elevator because it cannot afford to convert that one as well. While laws protecting the environment and workers should not be flouted, the state should try to find ways in which the companies can meet the spirit of the law without undue hardship.

While the state should not try to save "dying" firms, the shoe industry is so important to individual regions of the state that it cannot be ignored. Because these communities have below-average levels of employment and income, some consideration should be given to efforts which could slow the demise of the shoe industry. This could buy time to bring in new businesses.

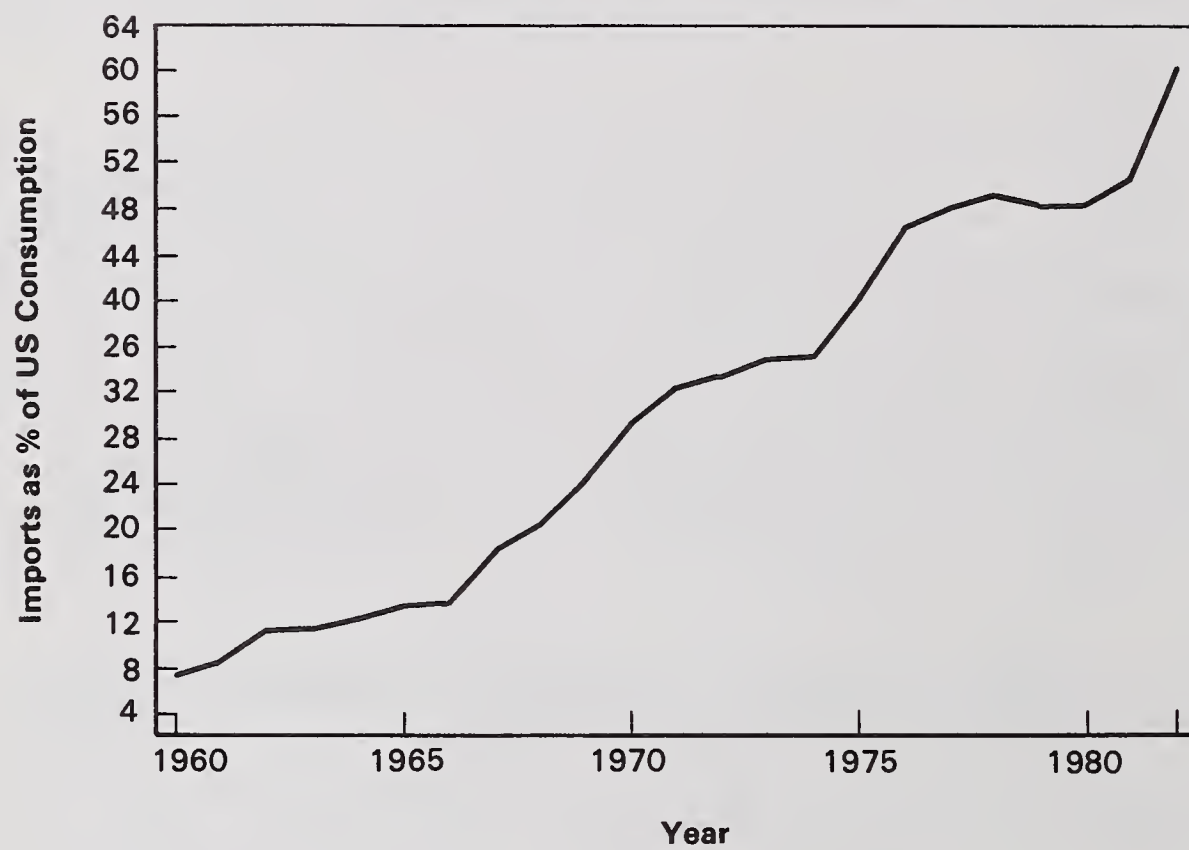


# **EXHIBIT 1** **Domestic Consumption, Production and** **Imports of Shoes**



Source: Footwear Industries of America, Footwear Manual, 1984

**EXHIBIT 2**  
**Import Penetration of Shoes**



Source: Footwear Industries of America, Footwear Manual, 1984



**EXHIBIT 3**  
**Major Sources of Non-Rubber Footwear Exports to the United States**

<u>COUNTRY</u>	<u>PERCENT OF UNITED STATES IMPORTS 1982</u>
Taiwan	38%
Korea	19%
Italy	12%
Brazil	9%
Hong Kong	<u>5%</u>
	83%

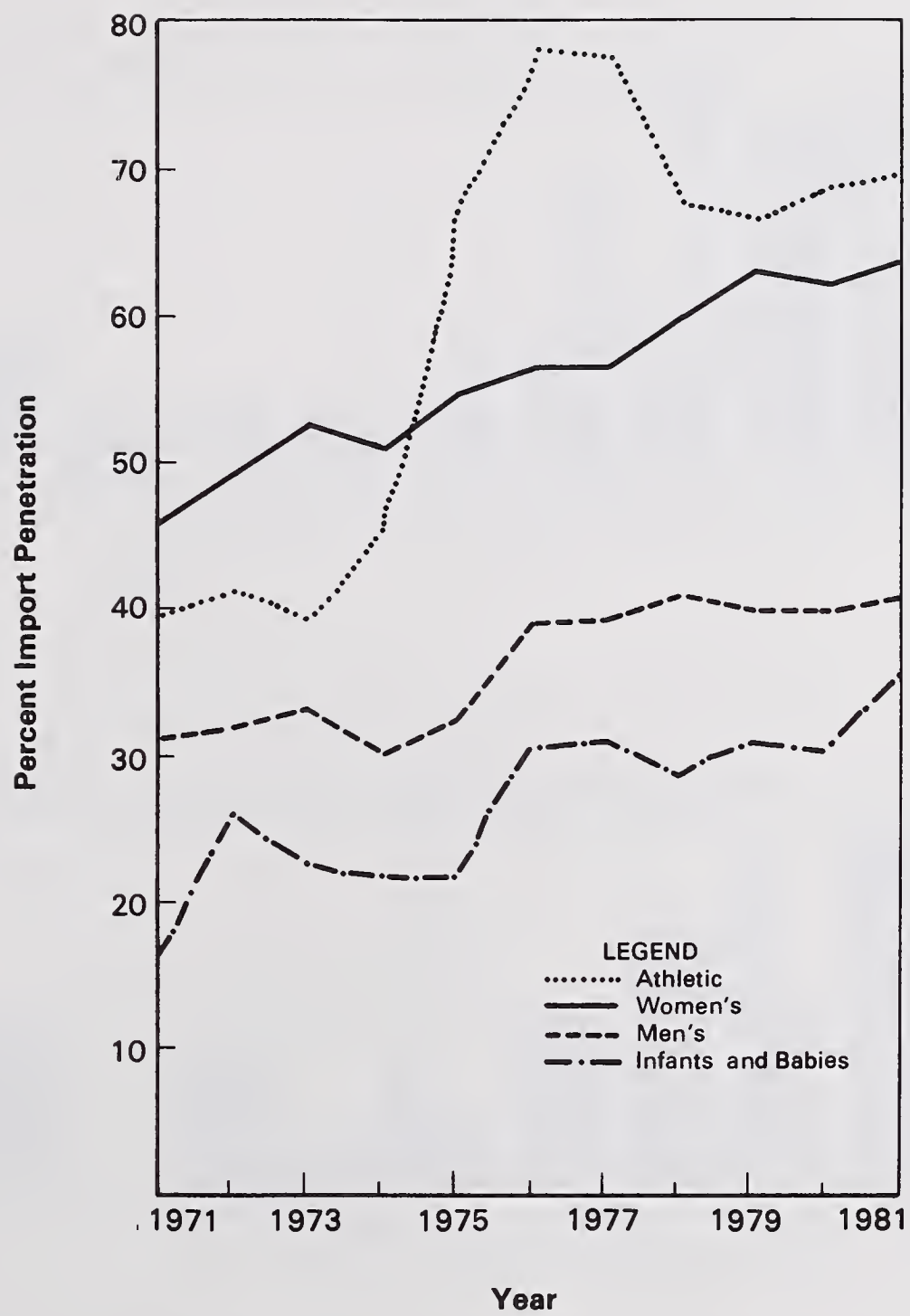
**EXHIBIT 4**  
**Estimated Total Hourly Compensation in Footwear and**  
**Leather Industries of Major World Exporters**

<u>COUNTRY</u>	<u>COMPENSATION</u>
Taiwan	\$1.38 - \$1.46
Korea	\$ .88
Italy	\$5.78
Brazil	\$1.08
Hong Kong	\$1.33
United States	\$6.22

Source: Footwear Industries of America, Footwear Manual,  
1984

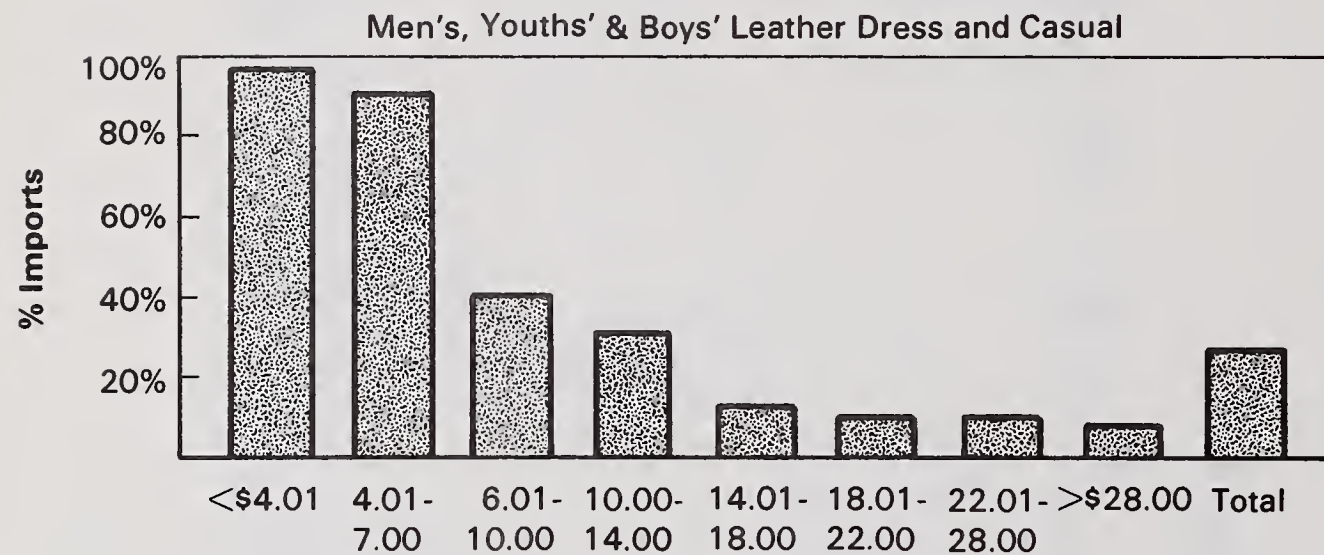


**EXHIBIT 5**  
**Import Share by Shoe Segment**



Source: Footwear Industries of America, Footwear Manual, 1983

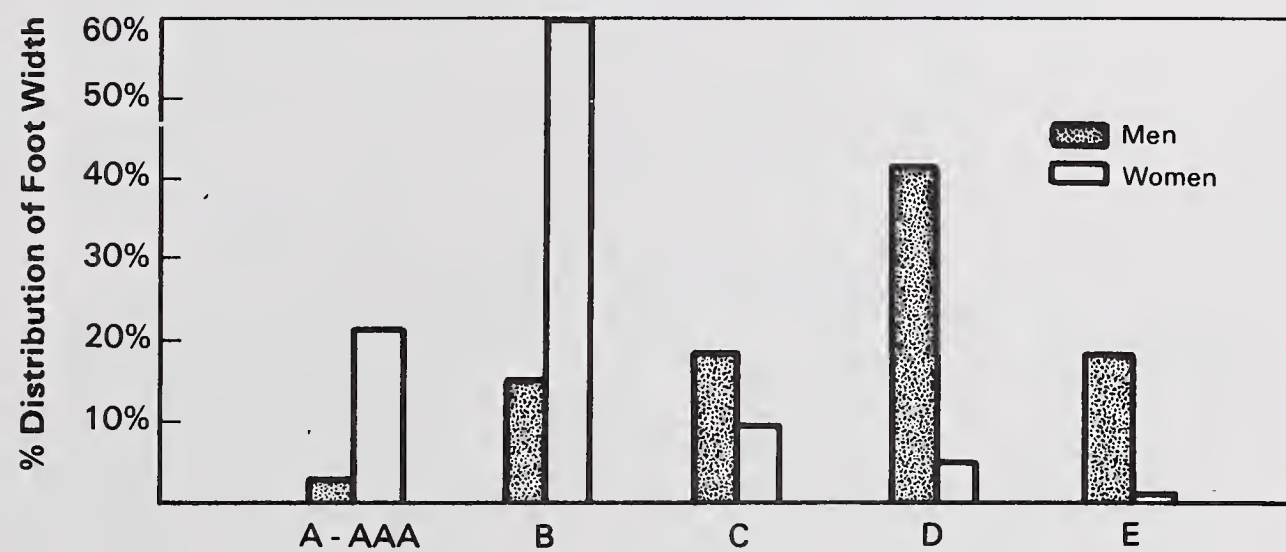
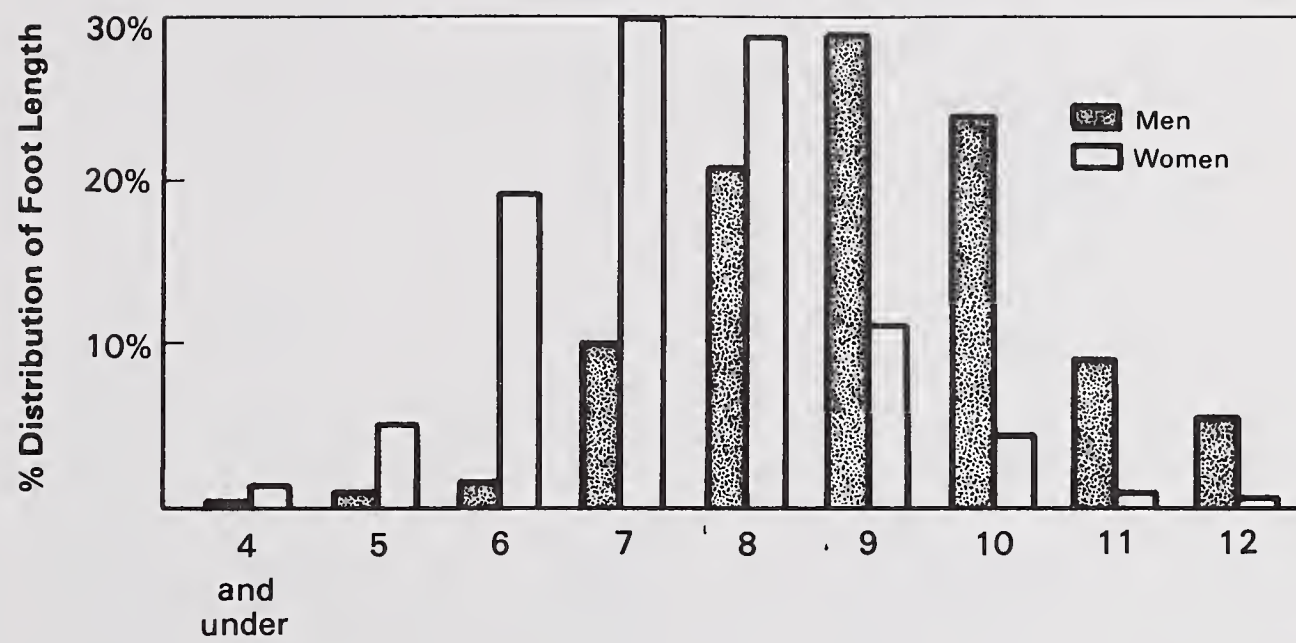
# **EXHIBIT 6** **Import Penetration in Shoes by Wholesale Price Range**



Source: Footwear Industries of America, Footwear Manual, 1983



# **EXHIBIT 7** **Distribution of Foot Size**



Source: Footwear Industries of America, Footwear Manual, 1983

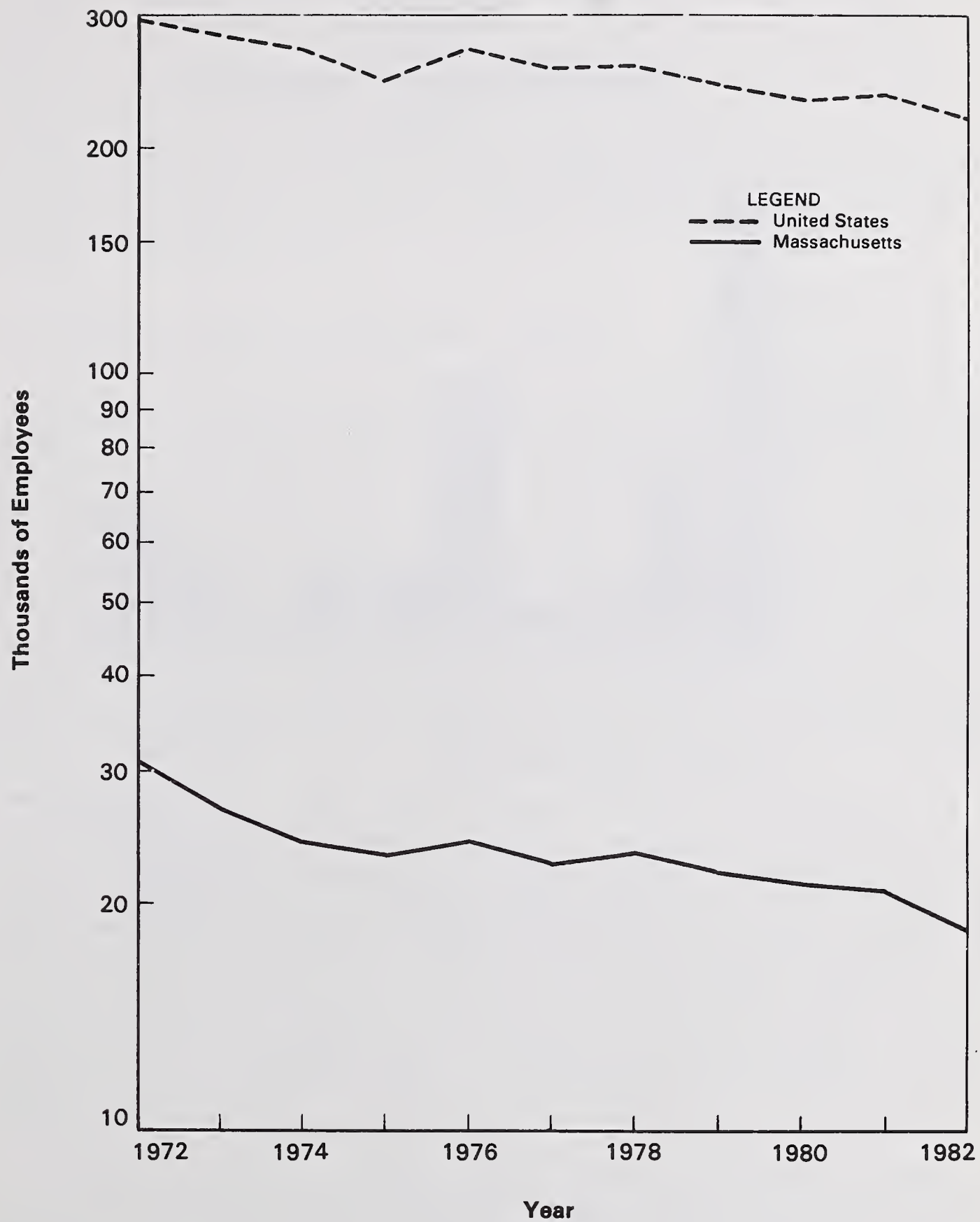
**EXHIBIT 8**  
**Average Import Price as a Percent of**  
**United States Domestic Manufacturer's Price**

<u>COUNTRY</u>	<u>1971</u>	<u>1981</u>
Taiwan	15%	41%
Korea	35%	57%
Brazil	55%	65%
Italy	76%	80%
Hong Kong	16%	16%

Source: Footwear Industries of America

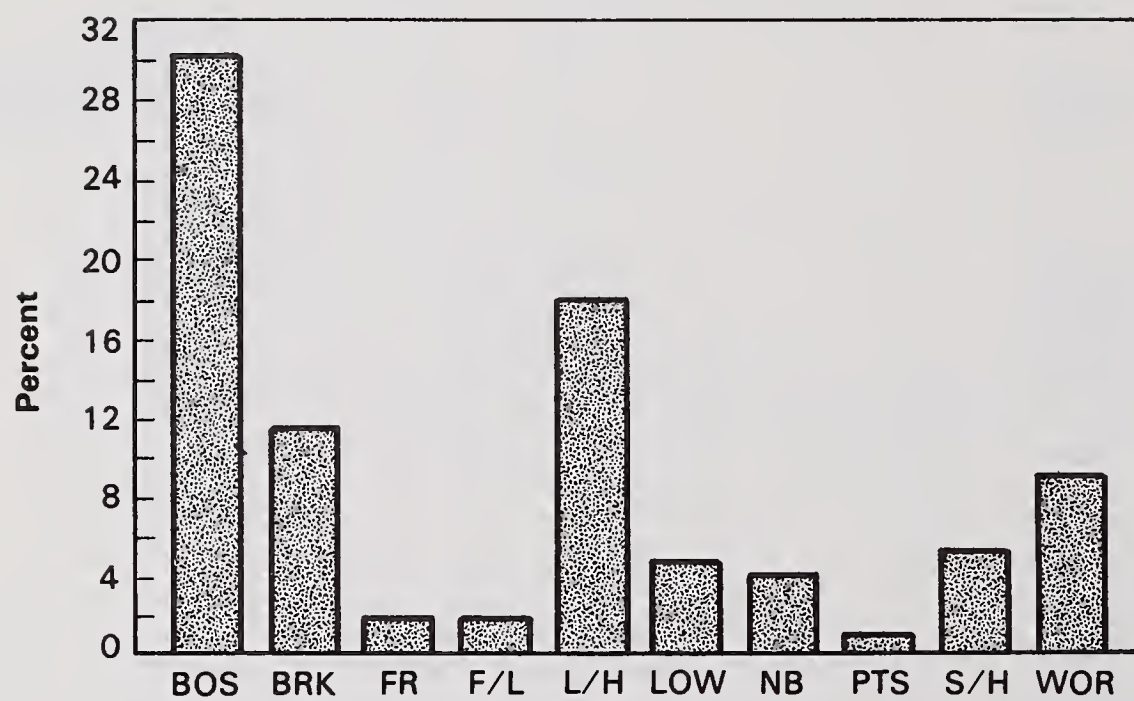


**EXHIBIT 9**  
**Employment in the Footwear**  
**and Other Related Products Industries**  
**Massachusetts and United States**



Source: Footwear Industries of America and Massachusetts Division of Employment Security

**EXHIBIT 10**  
**Shoes**  
**Regional Distribution of Employment**  
**(1981)**



Total 1981 Employment = 20700

Source: Massachusetts Division of Employment Security

**LEGEND**

BOS = Boston  
 BRK = Brockton  
 FR = Fall River  
 F/L = Fitchburg/Leominster  
 L/H = Lawrence/Haverhill  
 LOW = Lowell  
 NB = New Bedford  
 PTS = Pittsfield  
 S/H = Springfield/Holyoke  
 WOR = Worcester



## THE APPAREL INDUSTRY

At the national level, the major issue facing the apparel industry is the influx of imports from low wage nations. From the Commonwealth's perspective, the range of issues is broader. The highly competitive and fragmented nature of the industry has resulted in many labor-related problems and a high degree of turnover among firms. Because certain regions of the state are highly dependent on the garment industry, the ability of these firms to upgrade their competitive position and at the same time provide acceptable working conditions is crucial to particular communities and worker constituencies.

### THE INTERNATIONAL AND NATIONAL CONTEXT

Particularly since the 1960s, apparel imports from such countries as Taiwan, Hong Kong, Korea and more recently, the People's Republic of China, have been increasing. They now account for an estimated 45% of the domestic market for garments. This has occurred at a time when the U.S. market has been essentially flat (Exhibit 1). The apparel trade deficit has, as a result, been increasing and reached \$8 billion in 1983, representing 25% of the country's balance of merchandise trade deficit (Exhibit 2). Employment in the industry has declined from 1.44 million in 1973 to 1.16 million in 1982, a drop of 19%. The International Ladies Garment Workers Union estimates that if imports were at their 1955 level, the domestic industry would be over 650,000 jobs larger.

Imports have made such inroads in the U.S. market despite restrictive trade policies. As early as 1933, U.S. cotton textile manufacturers sought to have tariffs and quotas established to restrict the import of cotton products. Today, the U.S. regulates imports of 59 out of approximately 110 textile and apparel product categories from 11 countries through the International Multifiber Arrangement (MFA). Because foreign producers can switch into new product lines not covered by the MFA and because new countries are continually developing export capabilities in apparel, it is extremely difficult to control the level and mix of imported garments into the U.S.

Imports are of varying importance in different categories of apparel. For example, women and girls' sweaters, men and boys' shirts, cotton blouses, and cotton skirts all have import penetration rates of between 40% and 70%. In contrast, hosiery, men and boys' trousers, dresses, and men and women's suits have import penetration rates under 20%. The factors explaining such differences are a function of the



market size, importance of style, ability to automate production, fabric type and the importance of labor costs relative to the total cost of the goods for each garment category.

Unlike the steel and auto industries, where imports originate from foreign manufacturers, apparel imports typically are arranged for by domestic manufacturers and large retailers who contract with foreign plants to perform the sewing operations. The U.S. interests often control the design, selling, marketing and distribution functions themselves. The fabric is purchased abroad and the finished garments imported under some quota restrictions. Domestic producers can also cut the fabric in the U.S. and ship the garment pieces to be stitched in a low wage country. When the completed garment is sent back to the U.S., duty is paid only on the value of the labor added to the product, not the total product value. This encourages manufacturers to utilize foreign labor. The position of the industry and labor unions are split over this code in the trade regulations. Currently, the ILGWU is engaged in a campaign to eliminate this code and also to restrict imports to 25% of the domestic market. The Amalgamated Clothing and Textile Workers Union is also working to restrict imports in menswear categories.

Besides dealing with the problems of imports, garment manufacturers have to stay attuned to their fickle markets. Lifestyle changes, such as women reentering the workforce and the trend towards more casual dress patterns, as well as fashion trends and the strength of the economy result in cycles of demand for various product categories. While there is some flexibility for individual manufacturers to shift between segments, smaller companies tend to specialize in either the men or women's markets and either tops (shirts and blouses) or bottoms (skirts and trousers). Sweaters and hosiery represent completely different businesses.

As a result, the industry is highly fragmented, with over 24,000 apparel establishments in the U.S. Sixty-five percent of them employ less than 50 workers and less than one percent employ over 500 people, although there is a trend towards fewer and larger operations. The industry is highly competitive and profit margins are among the lowest for any industry in the U.S.

In many ways, the women and men's markets constitute two very different businesses. The menswear market tends to be relatively stable in terms of the basic structure of the garments, with long run lengths possible. As a result, menswear manufacturers tend to be relatively large businesses and are somewhat able to automate various aspects of the production process.



The women's market is much more dynamic. Styles are much more varied and fashion trends can occur with lightning speed. With four seasons a year (spring, summer, fall and holiday or cruise) and women's preference for somewhat unique garments, runlengths for any particular style are relatively short. Demand for any particular style is unpredictable and can fluctuate dramatically in relatively short periods of time. Consequently, it is important for manufacturers to be able to respond quickly to varying levels of demand. As a result, the women's end of the business is structured somewhat differently from the men's side.

Unlike the typical menswear manufacturer who actually produces the garment as well as selling, designing and distributing it; many womenswear manufacturers do not actually cut and sew all the garments they design and sell. An important part of the domestic industry is made up of "contractors" who bid for the cutting and sewing of materials provided by manufacturers. Such an industry structure allows the manufacturers to vary production capacity through the contractors. They contract out reorders when a garment is a big seller and do not themselves have to deal with many labor issues.

The industry is spread throughout the country, with fashion and tailored garments typically manufactured in major urban areas in the Northeast and West Coast. Production of high volume, standard goods like jeans and slacks tends to be located in the southern states. Much of the industry shifted to the South in the 1950s and 60s to access non-union, cheaper labor. However Pennsylvania, New York and California are still the states with the largest numbers of garment workers.

Like many other mature industries, new forms of production technologies have recently been developed for the apparel industry. New technologies include computer assisted pocket setting and stitching systems; workspace management systems; and automation of production scheduling, ordering and billing.

Draper Labs in Cambridge has developed a computerized sewing system which can make sleeves, the back of suit coats and vests, and eliminate 25% of the manual sewing needed to make a suit coat.

Draper Labs project, a unique joint venture between a group of apparel and textile firms, the ACTWU and the U.S. Department of Commerce, is an important indication of the recognized need for making the U.S. apparel industry more productive through automation. The ACTWU hopes that such efforts will pay off through recapturing the U.S. market from imports and thus make up for jobs lost to automation. However, the Draper Lab project, funded at \$2 million, pales



beside a \$50 million Japanese research program aimed at the automation of apparel production.

Such forms of capital-intensive equipment will be most applicable in the menswear end of the industry, where the garments are produced in long runlengths and where the overall size of the business makes it possible for manufacturers to afford this type of equipment.

Successful strategies for companies in the apparel industry fall into three main categories: diversification, automation and special niches. Diversification strategies are generally pursued by large manufacturers who develop broad product lines, with a number of plants dedicated to specific garment types in both the U.S. and abroad. In this way, the company can produce both standard and fashion goods in the least expensive location and shift production when one item becomes a hot seller. These companies develop economies of scale in purchasing, production logistics, marketing and advertising (for branded goods).

Automation strategies are pursued by manufacturers of standard items with high volume levels. This approach is most applicable in menswear, where companies such as Hathaway Shirts have developed technologies (such as those mentioned earlier) to substitute capital for much of the labor involved in garment manufacture.

Niche strategies are pursued most frequently by smaller firms who have found small markets they can serve by supplying some mix of special styling, quality, fast delivery and high degree of customer service. Some Massachusetts firms have developed businesses in "active wear" (jogging suits and bicycling garb), children's clothes and contract work for higher-priced women's sportswear.

#### THE MASSACHUSETTS APPAREL INDUSTRY

Relative to the U.S., the state's apparel industry is concentrated in men's and boys' suits and coats, women's and misses' outerwear and miscellaneous textile products such as curtains (Exhibit 3). In terms of the state's share of national employment, Massachusetts is particularly strong in suits and coats for men and boys and in curtains (Exhibit 4). Menswear manufacturing in the state is concentrated in a relatively few large manufacturers such as Anderson-Little, while womenswear is produced primarily by smaller contractors. Statewide, the apparel industry represents less than 2% of all jobs and 6% of all manufacturing employment. From a regional perspective, Boston, New Bedford and Fall River account for the largest numbers of apparel workers (Exhibit 5). However, the industry is most critical to the Fall River economy, where it represents 40% of manufacturing



employment and 17% of all jobs in the Fall River area. It is also critical to the New Bedford economy, representing 35% of manufacturing employment and 13% of all jobs in that region of the state. Contractors for women's apparel employ a large percentage of garment workers in the Fall River and New Bedford area.

The degree to which the Commonwealth should be concerned about the future of its apparel industry depends on two factors:

- the potential of future employment opportunities in apparel and the quality of those jobs and
- the chances for comparable or better employment opportunities to be developed should the industry decline in those areas like Fall River, where apparel manufacturing is critical.

Between 1973 and 1982, the state lost apparel industry jobs at the same rate as the nation. The decline in apparel manufacturing employment in the state seems relatively mild when compared to that in the textile and shoe industries, dropping 38% since 1950, compared to declines of 83% and 78% in textiles and shoes respectively (Exhibit 6).

To some extent, however, these numbers are misleading. Due to the erratic nature of contract operations in the apparel industry, many garment workers are employed for considerably less than 40 hours a week 50 weeks a year. Data from the 1980 Census shows that only 60% of apparel workers were employed for more than 48 weeks in the prior year, versus 77% of all workers in manufacturing. In addition, over one-third of all apparel workers were employed for less than 36 hours a week, in contrast to all workers in manufacturing, where 88% worked over 36 hours a week.

This is in large part because contractors in the state hire and lay off workers as they obtain and fulfill individual contracts for goods. For the most part, manufacturers who do their own marketing and selling directly to retail outlets are able to provide more stable employment.

Depending on who one speaks with, there is either a shortage or surplus of garment workers in the state. Manufacturers argue they cannot get enough workers to meet production. The Worker Education For the 80's Project, a study of the Fall River women's apparel industry sponsored by the New England AFL-CIO and Boston College, found several reasons to explain the situation. First, workers who are temporarily laid off tend to be loyal to their firm and will not move to another contractor when they expect to be rehired in time by their old employer. Second, workers in the industry are specially trained for specific tasks. One is a



spreader, cutter, stitcher, presser or has some other very specific function in the manufacturing process. Available jobs may not correspond to a particular worker's occupation. Third, people who are unemployed and not apparel workers do not want to go into the industry because of its instability and its reputation for having a generally unpleasant working environment. At a state level, there may be a shortage of workers in Fall River and a surplus in Boston but no feasible way to temporarily transport workers.

The structure of the workforce in the apparel industry has several important characteristics. Like the industry nationwide, the Massachusetts industry primarily employs women. According to the 1980 Census, 76% of all workers in the Massachusetts apparel industry are women, compared to only 35% of all Massachusetts workers in the manufacturing sector. Fifty percent of all workers in the industry do not have a high school diploma, as compared to only 21% in the manufacturing sector overall (Exhibit 7). Many of the women workers will not travel far to work, preferring to be close to their children and neighborhoods. In addition, many garment workers are immigrants, whose English language capabilities limit their employment opportunities in other fields. Such workforce characteristics have important implications for the types of jobs that would be suitable for these workers should the industry continue to decline.

The relatively slow decline in the apparel industry in the Commonwealth masks a high degree of corporate turnover. It is relatively easy for a garment manufacturer to get into and out of business. Machines and space can be rented. There is no inventory for contractors who produce to order and do not even own the material provided by the manufacturers. As a result, when a company does not get new orders, loses a major account or wants to reduce wages, an owner can close up one business and open a new one under a different name. Since manufacturers are buying the ability of an individual to deliver goods, they do not care if the company name has changed. The Worker Education For the 80s Project mentioned earlier tracked unionized apparel firms in the Fall River area. They found that in 1982, 15 unionized factories closed but seven of them reopened under a new name. Five new factories opened during this period, so there was a net decline of only three businesses.

In effect a vicious cycle has been created in the apparel industry, particularly in the women's segment:

- Small contract shops go after individual orders through intensive price competition which holds down wages and minimizes owners' profits and ability to upgrade production processes and the work environment.



- Workers therefore have highly unstable employment patterns.
- People do not enter the industry because of this instability and poor working conditions, while firms claim they cannot get the workers they need.
- Contractors argue that they do not bid for large contracts since they cannot be sure of getting needed workers. They are left to compete aggressively against each other for smaller contracts, assuring a continuation of the pattern.

Other factors contribute to sustaining this vicious cycle. In Fall River especially, the industry employs a large number of Portuguese. Second generation Portuguese identify it with their parents and want to find jobs with a better image or more status. They have looked to service sector jobs for work in "white collar" office surroundings. Even when salary and benefit levels are not as good as those provided by unionized employment in the garment industry, they will tend to choose those jobs which enable them to escape from a factory surrounding. Job definitions are highly specialized. Because a stitcher, for example, cannot be transferred to other operations in the manufacturing process, employment for individual workers in factories with contracts is not stable. The Division of Employment Security allows apparel workers to collect benefits when they work less than a full week and allows apparel workers to remain on unemployment for a period of time when jobs are available, but not with their old employers.

Contractors in the state often compete directly against each other for work. As a result, the industry is a fractious one, with little incentive for managers to cooperate with each other. Attempts to coordinate marketing programs in New York, training programs for workers, umbrella industrial revenue bonds for low-cost investment capital for smaller firms, and other cooperative ventures have yet to succeed. Breaking out of the vicious cycle becomes a difficult task.

There have been some glimmers of progress, however. The Fall River apparel industry participated in the federal Trade Adjustment Assistance Program through a shared time engineering program. The purpose of this project was to improve the productivity of individual operations by restructuring plant layout, work flow and piece rates, and to train "para-engineers" who could continue to fulfill these functions after the project ended. At the time of the



publication of the program's report, 25 firms had participated with the following results:

- labor productivity gains averaged 30% for the participating firms
- although piece rates were reduced, average daily earnings for workers remained the same or increased
- employment in the engineered plants had increased by almost 20%; and
- thirty-three employees had been trained and promoted to the position of para-engineer.

The program is generally regarded as a success by the plant owners, ILGWU and the Trade Adjustment Assistance Program. Some workers were dissatisfied because traditional patterns were changed and the pace of operations sped up. Some observers are still waiting to see if owners who are not profitable will invest any of their increased profits in better working conditions or continued operational improvements. However, this was an important exercise in cooperative participation for managers.

The Massachusetts apparel industry is affected by imports as well as its own internal structure. As the quality of goods manufactured abroad improves, the stitching of higher-priced garments is being moved overseas. One contractor in the Boston area who worked exclusively for a major U.S. manufacturer built a large new facility employing hundreds of people to meet the needs of this customer. Less than three years after the plant was built, the manufacturer canceled its relationship with the Boston contractor in order to move production abroad. The plant is currently operating, but at a fraction of its capacity.

Some contractors have tried to compete with imports by hiring immigrant labor and paying less than minimum wages. This occurs especially in the Boston area and makes it difficult for more reputable firms to compete. Other firms have recognized the need to find new market niches in which they can compete more fairly. Currently there are some attempts to locate contracts for very high-priced garments that would utilize both the skills of the Massachusetts workforce and take advantage of the Commonwealth's location near the major New York garment center. It is not yet clear how successful such efforts may be. Some industry and union officials still hope the industry can work together to improve profitability and worker conditions through a day care center for workers' children, training programs and shared equipment and purchasing arrangements.



There are varying opinions on how important it is to maintain an apparel industry in the state. Some feel that efforts should be geared to bringing in new industries to areas such as Fall River and New Bedford, because the apparel industry will continue to decline. A jointly sponsored trip to the West Coast by representatives of Fall River, New Bedford and Taunton to attract high technology to the area a few years ago, the recent completion of the extension of Route 495 and consideration of Taunton for the location of a new micro-electronics training center are examples of such efforts. There have been some attempts to build up the region as a tourist and residential area for people working in Providence and Boston.

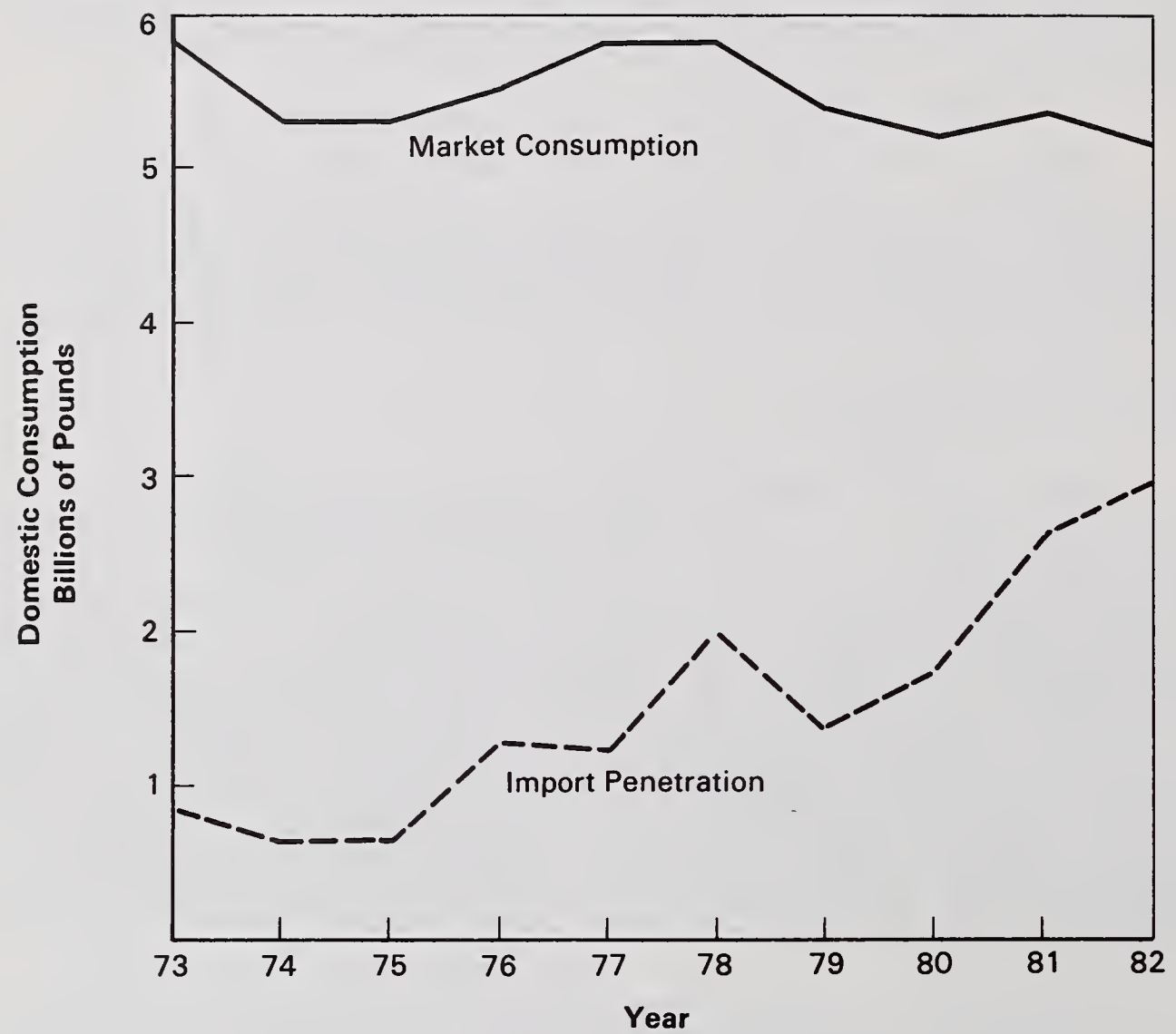
Whether these efforts will result in improved jobs for those people currently working in the apparel industry is unclear. In light of this, some people feel it is critical that attempts continue to be made to improve the apparel industry's ability to offer good jobs to the local workforce.

#### POLICY IMPLICATIONS

The apparel industry has traditionally been an important source of jobs to women, less educated members of the state's workforce and to certain regions of the state. Its future is in question, as much because of local factors inherent in the industry's structure as because of imports. Several ideas have been put forward to support the apparel industry and to break out of the vicious cycle described earlier. They include training programs which prepare workers for several positions in the manufacturing process, day care facilities to attract working mothers to the industry, centralized facilities to reduce overhead costs, joint purchasing programs and marketing efforts geared at identifying new niches.

Until it is clear that regions of the state such as Fall River and New Bedford can develop alternative sources of employment, the future of the apparel industry should be of concern to policymakers.

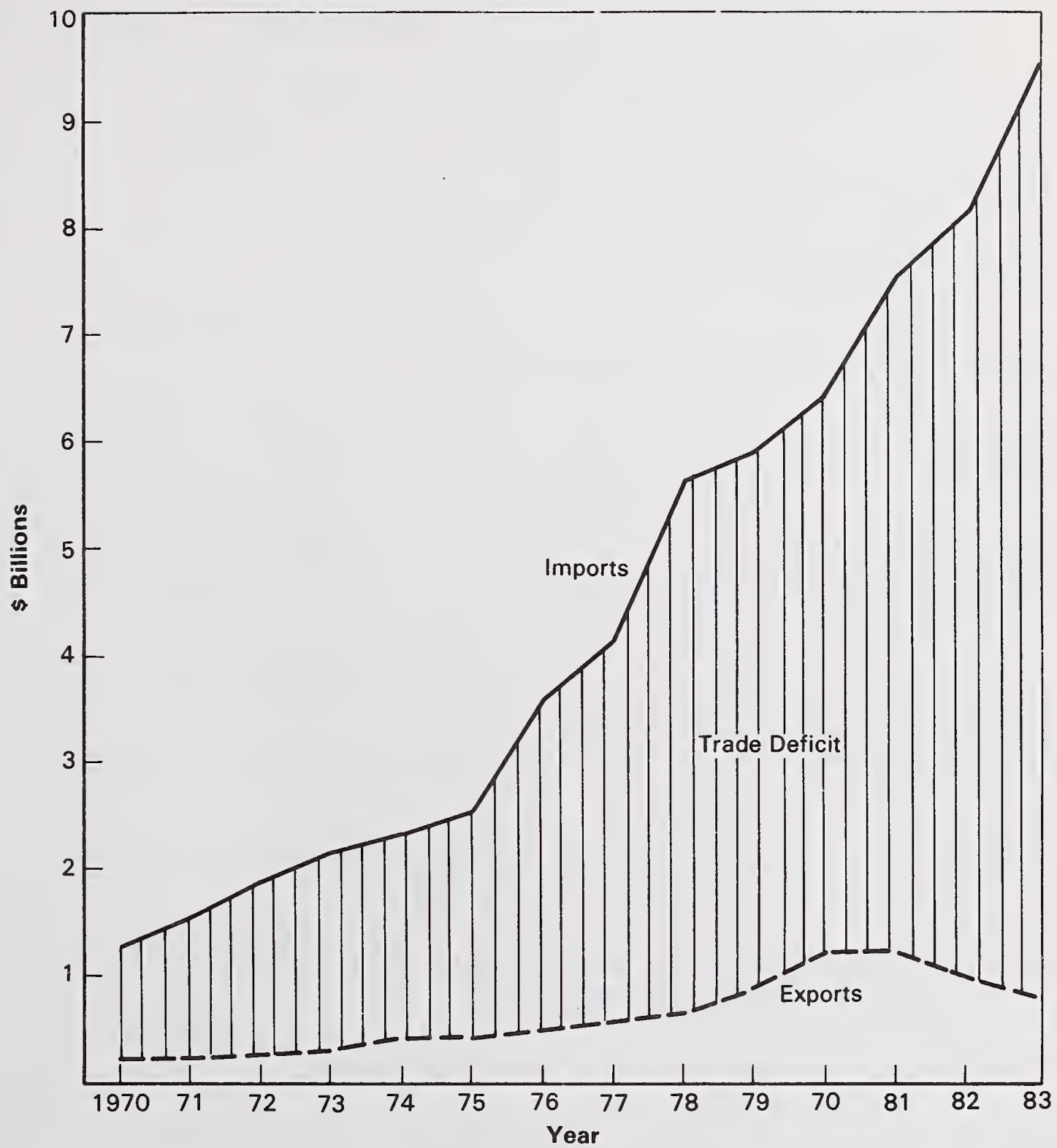
**EXHIBIT 1**  
**Import Penetration in the United States**  
**Apparel Industry**



Source: Textile Organon



**EXHIBIT 2**  
**United States Apparel Trade**



Source: United States Department of Commerce: FT 135, FT 410

**EXHIBIT 3**  
**Apparel Industry Employment Structure**

	<u>MASSACHUSETTS</u>	<u>UNITED STATES</u>
Men's and Boys' Suits and Coats	19.0%	6.9%
Men's and Boys' Furnishings	6.8%	27.4%
Women's and Misses' Outerwear	32.2%	32.4%
Women's and Children's Undergarments	5.6%	7.2%
Children's Outerwear	3.9%	5.1%
Miscellaneous Apparel (including: gloves, hats, raincoats, leather garments, furs and belts)	6.7%	6.2%
Miscellaneous Textiles (including: curtains and various home furnishings)	18.8%	14.8%
	<hr/>	<hr/>
TOTAL	100.0%	100.0%

Source: United States Department of Commerce, Bureau of the Census,  
County Business Patterns, 1981

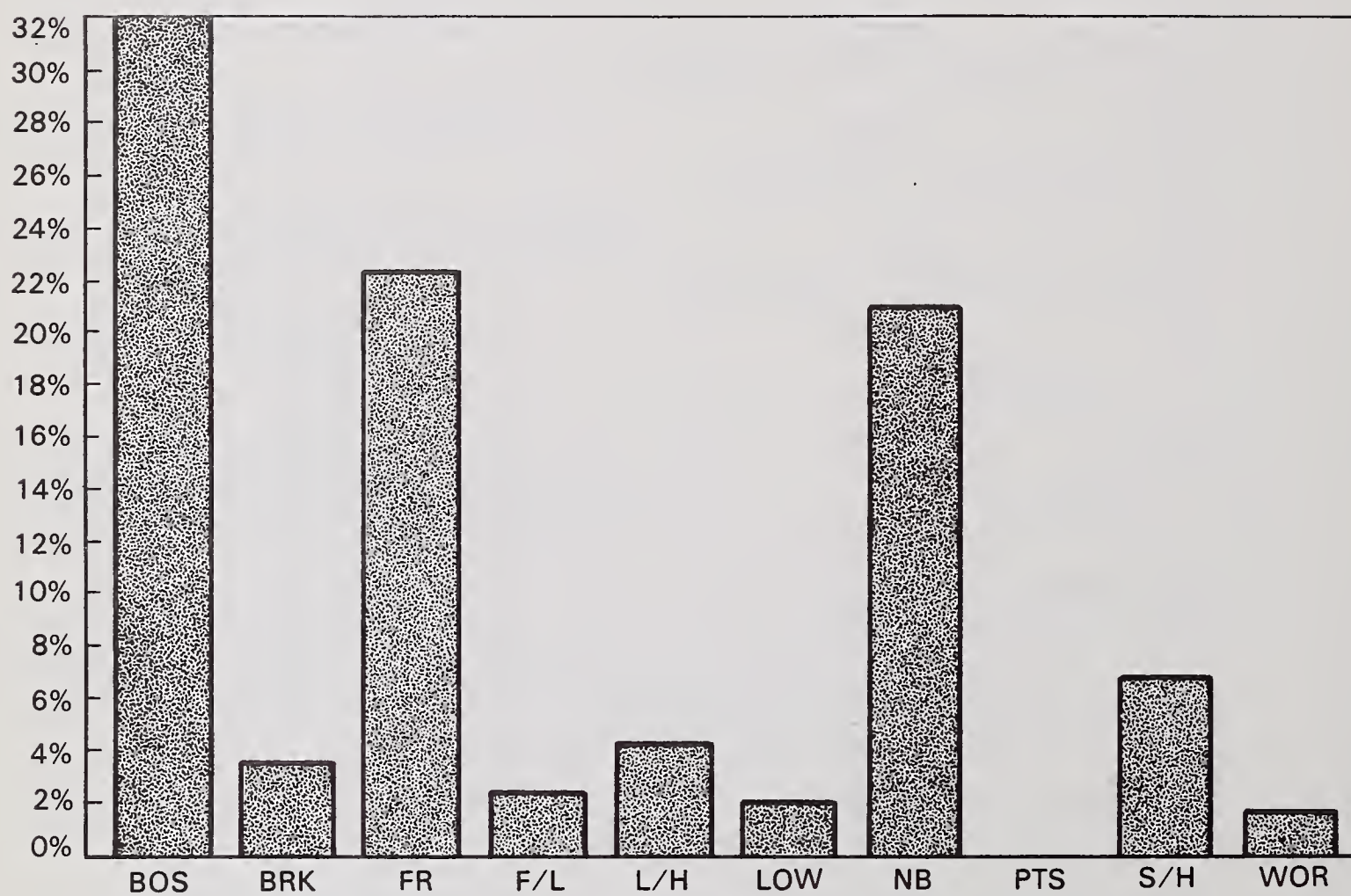


**EXHIBIT 4**  
**Massachusetts' Share of United States Apparel Industry**  
**Employment for Selected Segments**

	<u>PERCENT</u>
TOTAL INDUSTRY	3.2%
Men's and Boys' Suits and Coats	8.9%
Men's and Boys' Furnishings	.8%
Women's and Misses' Outerwear	3.9%
Blouses	1.3%
Dresses	3.3%
Suits and Coats	4.9%
Women's and Children's Undergarments	2.5%
Children's Outerwear	2.5%
Miscellaneous Apparel	3.4%
Miscellaneous Textiles	4.1%
Curtains	10.5%

Source: United States Department of Commerce, Bureau of the Census,  
County Business Patterns, 1981

# **EXHIBIT 5** **Regional Distribution of Employment** **in the Massachusetts Apparel Industry**



**Total 1981 Employment = 39300**

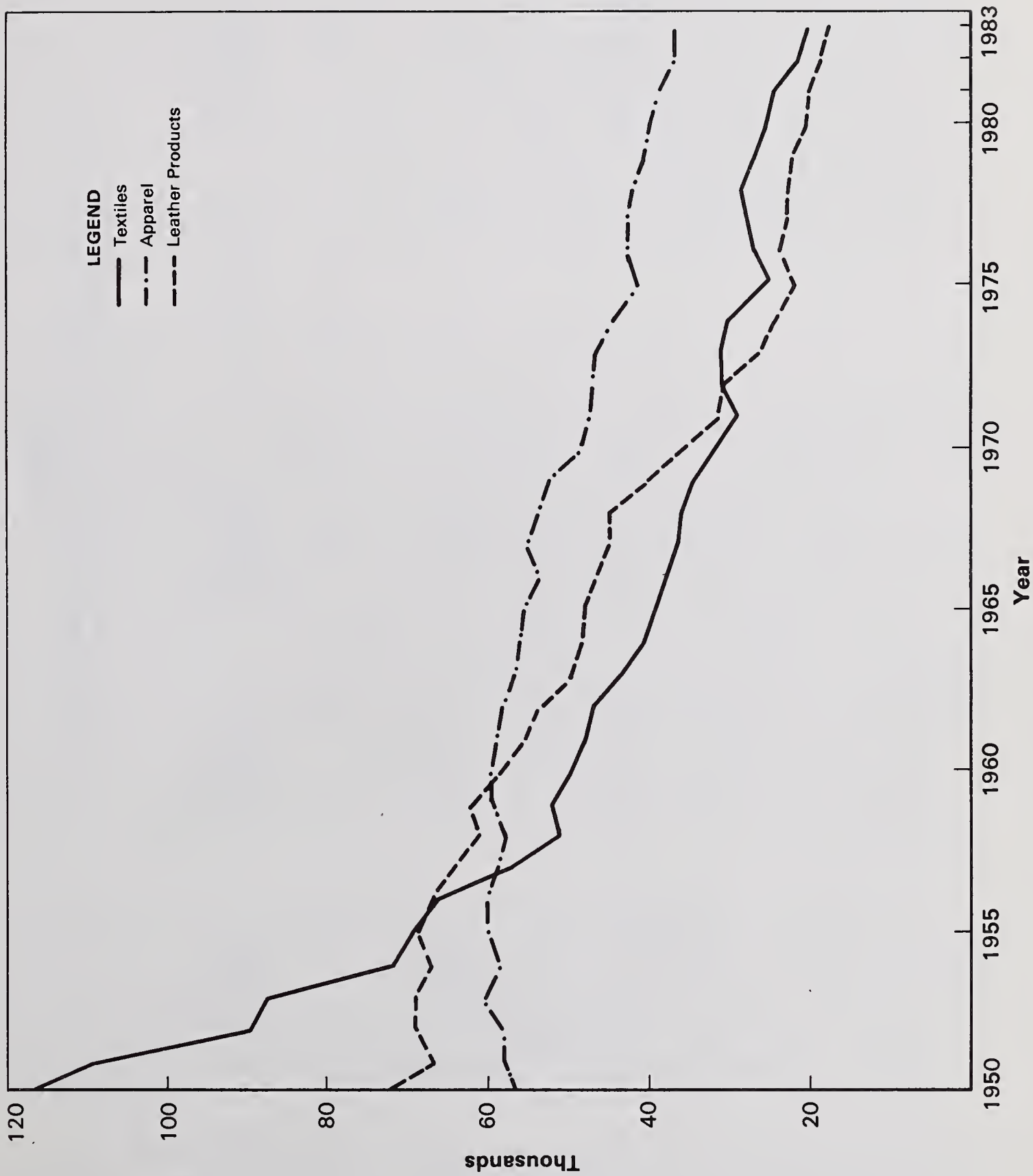
**LEGEND**

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Source: Massachusetts Division of Employment Security



# EXHIBIT 6 Massachusetts Employment in Apparel, Leather Products and Textiles



Source: Massachusetts Division of Employment Security, 790 Series

**EXHIBIT 7**  
**Educational Levels of Workers in the Apparel Industry**  
**and in All Manufacturing in Massachusetts**

	<u>ELEMENTARY</u> <u>GRADUATE</u>	<u>SOME</u> <u>HIGH SCHOOL</u>	<u>HIGH SCHOOL</u> <u>GRADUATE</u>	<u>SOME</u> <u>COLLEGE</u>	<u>COLLEGE</u> <u>GRADUATE</u>	<u>BEYOND</u> <u>COLLEGE</u>
Apparel Workers	32%	18%	25%	21%	3%	1%
All Manufacturing Workers	10%	11%	38%	26%	8%	6%

Source: United States Census, 1980



## THE TEXTILE INDUSTRY

The Massachusetts textile industry has undergone major changes over the 20th century. As part of the center of textile manufacturing in the United States in the 1800s and early 1900s, Massachusetts had, at its peak, 29% of all its manufacturing jobs in the textile industry in the early 1900s. Beginning in the 1920s, the industry began its move to the South where wages were low and workers not unionized. Today the textile industry represents 3% of all manufacturing jobs in the state. Over the past decades, the structure of the industry in the state has changed. Those firms which remain are ones which have been able to specialize in various market niches. Many familiar with the industry believe that the companies which remain are stable. Future employment trends will depend on the effects of new equipment on labor demand and whether expansions will take place in-state or elsewhere.

### THE NATIONAL AND INTERNATIONAL CONTEXT

The textile industry includes the manufacture of fibers, yarn, fabric and some final end goods such as household linens, carpets, diapers, disposable gowns and masks for the medical profession, and a range of industrial products including filters, tire cords, construction sheeting for the underbeds of roads and other products not usually thought of as textiles. Roughly 40% of all textiles are used for apparel, another 34% in home furnishings and the remaining 26% in a variety of industrial goods. As a result, the domestic industry's volume is affected indirectly by imported apparel and other products such as cars, as well as imports of textiles themselves. It is also affected by the business cycle, which impacts demand for home furnishings and some industrial products. Industry shipments grew through the 1960s and early 70s, but has been relatively stable since then, in large part because of the rapid increase in apparel imports (Exhibit 1).

Employment, on the other hand, continued to decline significantly over this period, after dramatic losses during the 1950s (Exhibit 2). Productivity increases averaging over 4% a year due in part to the introduction of new technologies has been a major factor. Although lagging other nations in its adoption of new production equipment, the U.S. textile industry in recent years has been investing heavily in new machinery.

As described in the companion industry study of textile machinery, new generations of ringless spinning technology, looms, and the adaptation of computers for production control



have revolutionized the industry since the 1960s. As described by the Institute of Textile Technology, management goal as reflected in the use of new equipment is going through several phases. In the 1960s, it was machine speed (shuttleless looms and high speed cards); in the 1970s the goal was reduced labor content (chute-fed cards); in the 1980s it is reduced skill dependency (module maintenance); and in the 1990s it will be automated manufacturing with the use of robotics and microprocessors.

These advances have had significant effects on productivity and consequently, the amount of labor needed for production. One company, National Spinning, used to employ 1,000 people to make about 100,000 pounds of yarn per week. Now they manufacture over 1 million pounds per week with 2,000 people, a productivity increase of 500%. Air and water jet looms have three times the speed and produce seven to eight times the fabric (in wider widths) than shuttle looms. According to a study of the industry by the National Academy of Engineering and industry representatives, the United States has the most productive textile industry in the world, especially in the production of certain fabrics and man-made fibers (Exhibit 3). Maintaining employment levels along with the introduction of these new production technologies will require larger U.S. share of both domestic and international markets.

The ability of the textile industry to export seems to depend on the relative strength of the dollar, international demand for particular types of fabric in which the U.S. is especially strong (denim and corduroy in the 1970s) and the openness of foreign markets. Exports in man-made fiber, yarn and fabric have been relatively strong, while cotton exports are very weak. Imports of apparel indirectly reduce demand for domestically manufactured textiles. For example, the Far East has particularly good quality knit and shirting fabrics. Because these fabrics are often used in apparel manufactured in the Far East, U.S. textile manufacturers are at a geographic disadvantage in these fabric categories. Imports of textiles as such, have grown at a much slower rate than apparel imports. As a result of all these factors, the trade balance in textiles has been stronger than that of apparel, but is subject to fairly wide fluctuations. Negative in the early 1970s, the trade balance was positive until 1982 (Exhibit 4).

Segments of the textile industry exhibit very different rates of growth. One very high growth area is non-woven textiles. While fabric production has typically involved some form of weaving or knitting yarn or threads, non-woven textiles involve some other form of binding fiber to make cloth. Felt is a familiar example of a non-woven textile. Roughly 30 years old, non-woven technology has recently been undergoing rapid technological advancement. Chemical



bonding, spun bonding and within the past ten years, hydro-entangled and thermal bonding have been opening up new ways to join fibers to make an expanding variety of products. The range of end-uses for non-wovens includes roofing material, grass cloth wallpaper, MacDonalds' caps, battery separators, and rolls for printing presses. In some cases, non-wovens are substituting for more traditional textile products; in other applications, it is substituting for durable products made from aluminum and steel, where the non-woven is part of a new composite material. In still other cases, such as fabric-in-dryer softeners, non-wovens are the original material. The U.S. market for non-wovens is expected to increase annually between 9% and 15% from 1983 to 1987, according to industry sources (Exhibit 5).

Despite such dynamic new segments as non-wovens, the textile industry has a very bleak image. Considerable improvements in working conditions due to federal legislation and newly designed machinery and equipment have not erased the image of the old, unhealthy textile mill. Some such mills do still exist, but they continue to be phased out.

Because of its bleak image, the high degree of technical expertise needed at various stages of textile manufacturing is often overlooked. Developing textiles with the required combination of strength, wicking, color-fastness, color matching, surface texture, and stain release requires considerable experience. Being able to manufacture textiles with consistent quality requires highly skilled operators and engineering backup. The introduction of computers into various aspects of the manufacturing process is further changing the nature of production jobs.

#### THE MASSACHUSETTS TEXTILE INDUSTRY

The structure of the Commonwealth's textile industry is quite different from that of the nation's. Fabric finishing (dyeing, printing and coating); woven wool and synthetic and knitted fabrics; and miscellaneous textile products such as felt, padding and coated products are segments in which Massachusetts textile employment is concentrated. For the U.S. as a whole, woven cotton and synthetic fabrics, knitted fabric and yarn and thread production are the largest segments (Exhibit 6).

In part, this represents the movement of large mills producing commodity fabric to the South. While there were once over 125 textile mills in the Fall River area alone, today the mill buildings which characterize the Fall River-New Bedford skyline are only partially occupied by companies, often from other industries.



Textile employment in the state is centered in Boston, Worcester, Lowell, Fall River and New Bedford. The industry is of significant importance to the economies of Fall River (where it represents 7% of all jobs), New Bedford (where it represents over 2% of employment) and to a lesser degree, Lowell (1.8% of total jobs).

Between 1950 and 1982, employment in the state's textile industry declined 83% (Exhibit 7). Those textile firms which remain are ones which have found specific market niches in which they could compete. Wool products, narrow fabrics, textile finishing and miscellaneous textile products are segments in which Massachusetts still has a relatively large share of national employment (Exhibit 8).

Dominating small niches has been the key business strategy for many Massachusetts textile firms. Tweave is a company that has capitalized on its special expertise in covering lycra to give special qualities to this stretch yarn, something which is more of an art than a science. It has 40% world share of the fabric used in women's girdles, as a result of its supplier relationship to Playtex. It has also supplied the women's swimwear, leotards and skiwear markets. Currently it is about to enter the high end upholstery fabric market with a stretch fabric that will enable furniture manufacturers to duplicate the high-priced curvy-designed furniture that has traditionally been the preserve of Italian manufacturers.

Quaker Fabrics is another Massachusetts company which dominates a niche: it is the largest manufacturer of polypropylene fabric used in upholstery. Other companies make fabric for auto upholstery, tapes for window blinds, seatbelt webbing, parachute cord, and shoe laces. Still other companies such as Cranston Printers specialize in finishing and printing fabrics, processes where quality and speed of delivery are important and where company size may not in itself be an important consideration. The state is also the location of the research labs for Albany International, where state-of-the-art work is being done in the areas of braiding, weaving and composite-structure formation.

There are several Massachusetts companies manufacturing non-woven textile products. Historically strong in woollens, the state is home to a handful of woolen felt manufacturers who together share over 50% of the market for woolen felt. Bacon Felt, for example, makes the felt used for the nibs in felt-tipped pens. Rexcut manufactures grinding wheels by bonding together reinforced layers of fabric. Foss Manufacturing makes landau roofing material. The Kendall Company, a major Massachusetts company employing between three and four thousand people in the state out of 10,000 employees nationally, is one of the most technologically



sophisticated non-woven manufacturers in the country. Beginning as a gauze manufacturer, the company moved into disposable medical products such as gowns and masks and consumer products such as infantwear and bedding, as well as textile products for industrial use. While it has diversified into medical instruments, it is still primarily a textile manufacturer. Its line of non-woven textile products includes top sheets for diapers, oil pipeline wraps, absorbant material for Tampax, and material for the roofing industry. Currently, it has a major share of the market for computer diskette liners (manufactured outside the state). It recently opened a Massachusetts facility to manufacture the jackets for these diskettes. Because the company's engineering operations as well as its headquarters are in Massachusetts, it chose the Commonwealth for this expansion into a business where quality control is critical.

As mentioned earlier, the textile industry has a reputation as a dismal and even unsafe place to work. Particularly in areas like the southeastern part of the state, young people associate the industry with these "mature" firms and some industry people find it difficult to attract workers. While some firms still utilize old equipment and are less than progressive in their work environment, other firms such as Albany International, Cranston Printers, and Arkwright have state-of-the-art equipment which has improved the quality of production jobs at the same time they have improved productivity and product quality.

The Textile Sciences Program at Southeastern Massachusetts University has been trying to change the industry's image and is an important source of professionals to the textile industry in the state and region. Since 1968, 42% of its graduates have worked in Massachusetts and an additional 29% have taken jobs in New England or New York. Some people familiar with the program have cited its lack of up-to-date equipment as a shortcoming in the training it offers its students. Lack of funding has limited the Program's ability to introduce its students to such new technologies as ringless spinning and some of the new types of looms.

Of particular concern to textile firms in the Commonwealth are high energy costs, a sizeable cost-component in certain segments of the industry. One company's bill runs upwards of \$13,000 a day. Environmental concerns such as water pollution seem to be less of a problem today than in the 1960s and 1970s.

Of concern to some workers is the possibility that new generations of equipment will eliminate their jobs. The Commission was not able to address this issue, but it should

be studied to determine the likelihood and magnitude of such a trend.

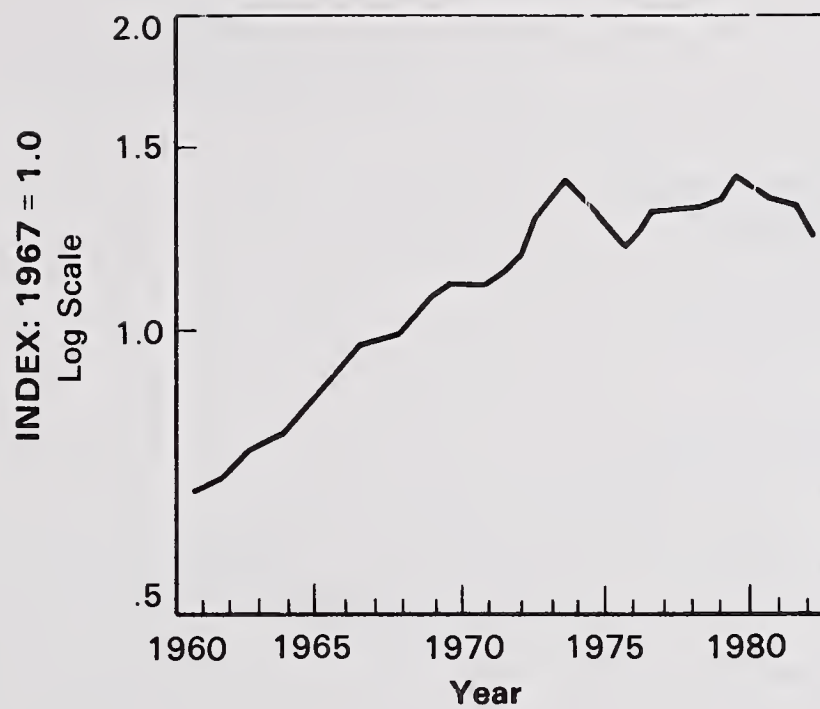
#### CONCLUSIONS

The Massachusetts textile industry had undergone a major contraction by the early 1970s. The firms which remain are focused on particular products or processes, and in general the industry is considered to have stabilized. The non-wovens segment may have the potential to grow.

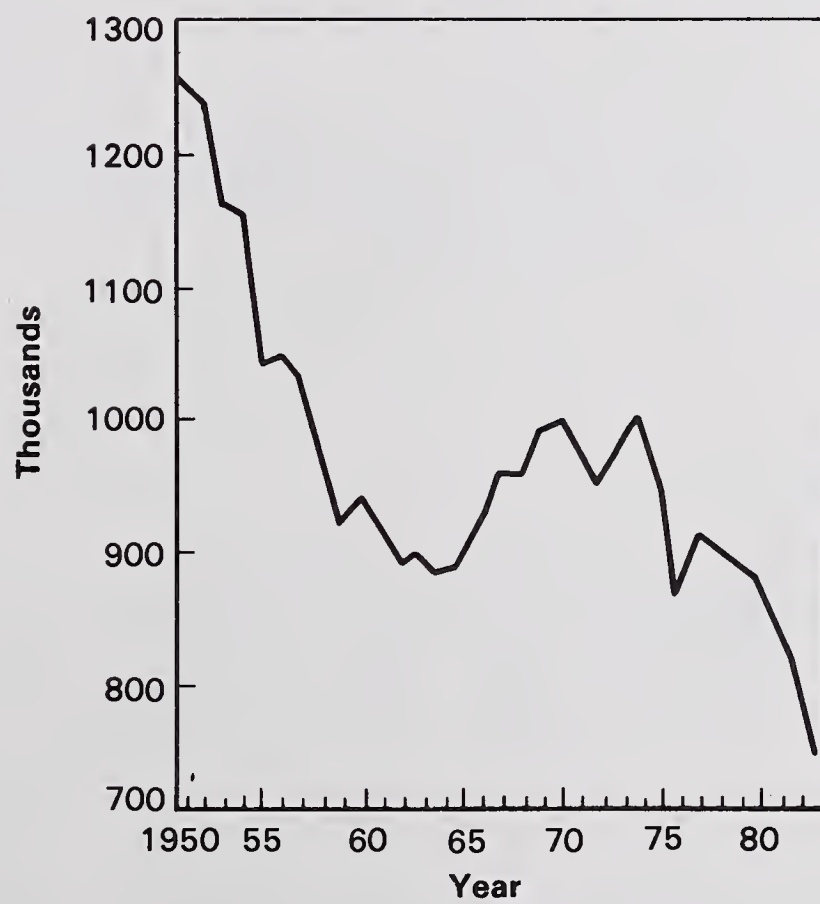
The introduction of more efficient equipment needed to keep firms competitive may bring with it a further reduction in employment. This may be a topic of importance for policymakers to consider.



**EXHIBIT 1**  
**Textile Production Growth**  
**in the United States**



**EXHIBIT 2**  
**United States Employment**  
**in the Textile Industry**



Source: Data Resources, Inc., The D.R.I. Report on U.S. Manufacturing Industries

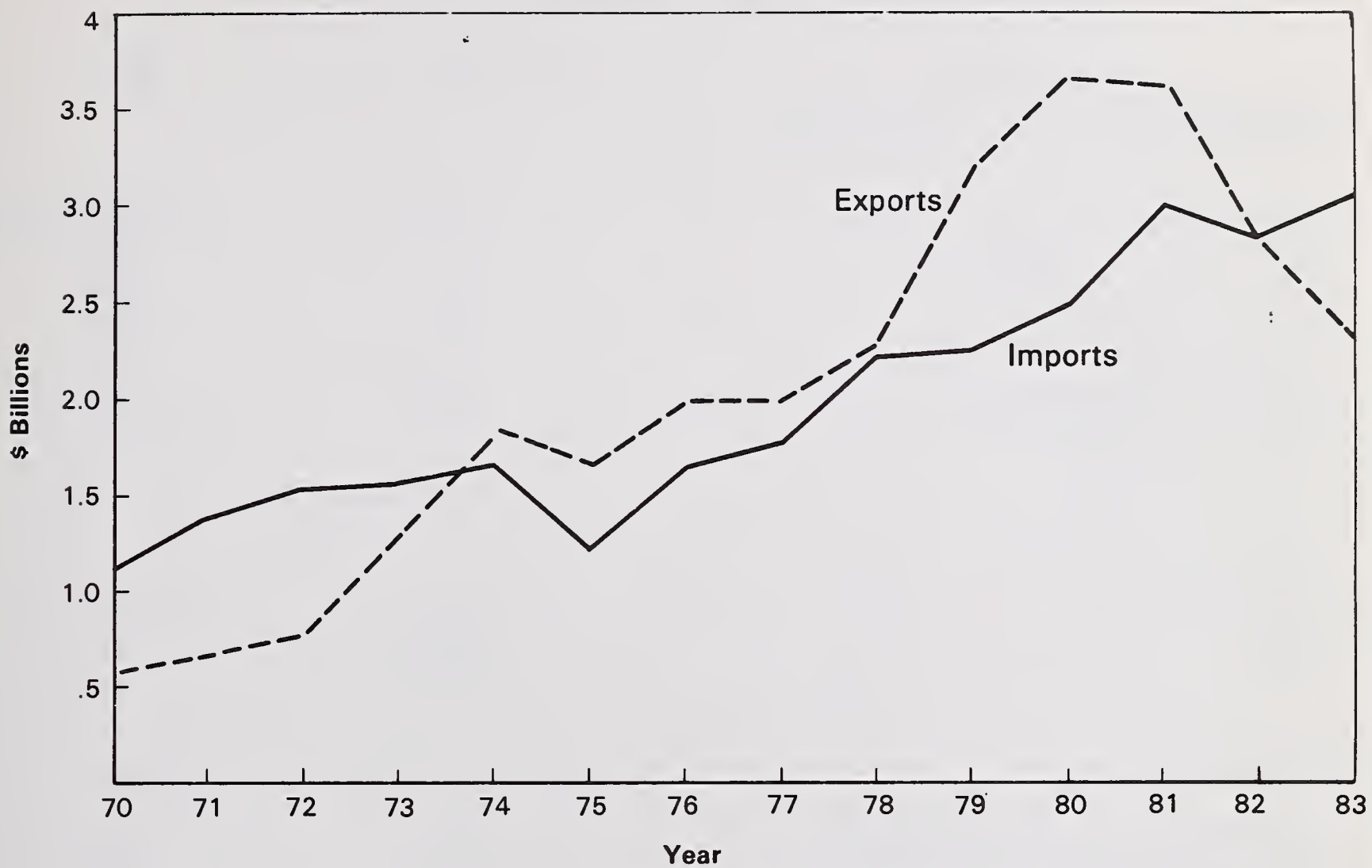
**EXHIBIT 3**  
**Spinning and Weaving**  
**International Productivity Comparisons**

	<u>INDEX</u> <u>UNITED STATES = 100</u>
United States	100
West Germany	85 - 95
Japan	75
Hong Kong	50
Taiwan	45
South Korea	45
Pakistan	10

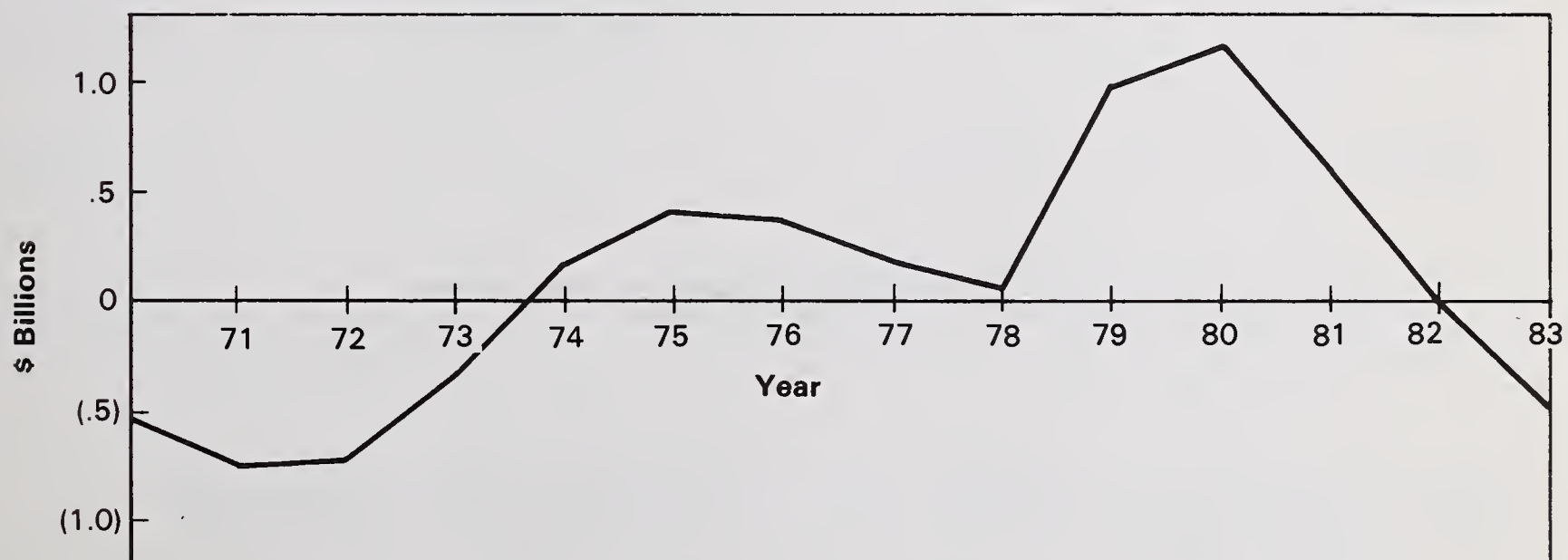
Source: Werner Associates, 1981, The Competitive State of the United States Fibers, Textiles and Apparel Complex



# **EXHIBIT 4** **Unites States Textile Trade**



## **Trade Balance**



Source: United States Department of Commerce: FT135

**EXHIBIT 5**  
**The United States Market for Nonwovens\***

<u>APPLICATION</u>	<u>1983</u>	<u>1987</u>
CONSUMER DISPOSABLES		
Baby diapers	\$2,300	\$4,000
Adult diapers	\$25	\$300
Wipes and roll towels	\$250	\$500
Fabric-in-drier softeners	\$225	\$300
Surgical packs	\$200	\$350
Surgical gowns	\$60	\$150
Surgical masks, caps, shoe covers	\$70	\$125
Hospital bed underpads	\$80	\$115
Medical dressings	\$70	\$150
INDUSTRIAL DISPOSABLES		
Filtration media	\$300	\$600
Wipes	\$100	\$250
Other	\$50	\$75
DURABLES		
Interlining-interfacing (apparel)	\$125	\$200
Coated and laminated products	\$100	\$100
Home furnishings	\$100	\$180
Carpet backing (primary, secondary)	\$125	\$175
Geotextiles/civil engineering	N.A.**	N.A.**
Roofing	\$100	\$200
Other	<u>\$100</u>	<u>\$150</u>
TOTAL	\$4,380	\$7,920

\* As measured in millions of dollars of point-of-use sales.

\*\* N.A. = not available.

Source: Maran Marketing Company, Inc., as published in Textile Industries,  
March 1984

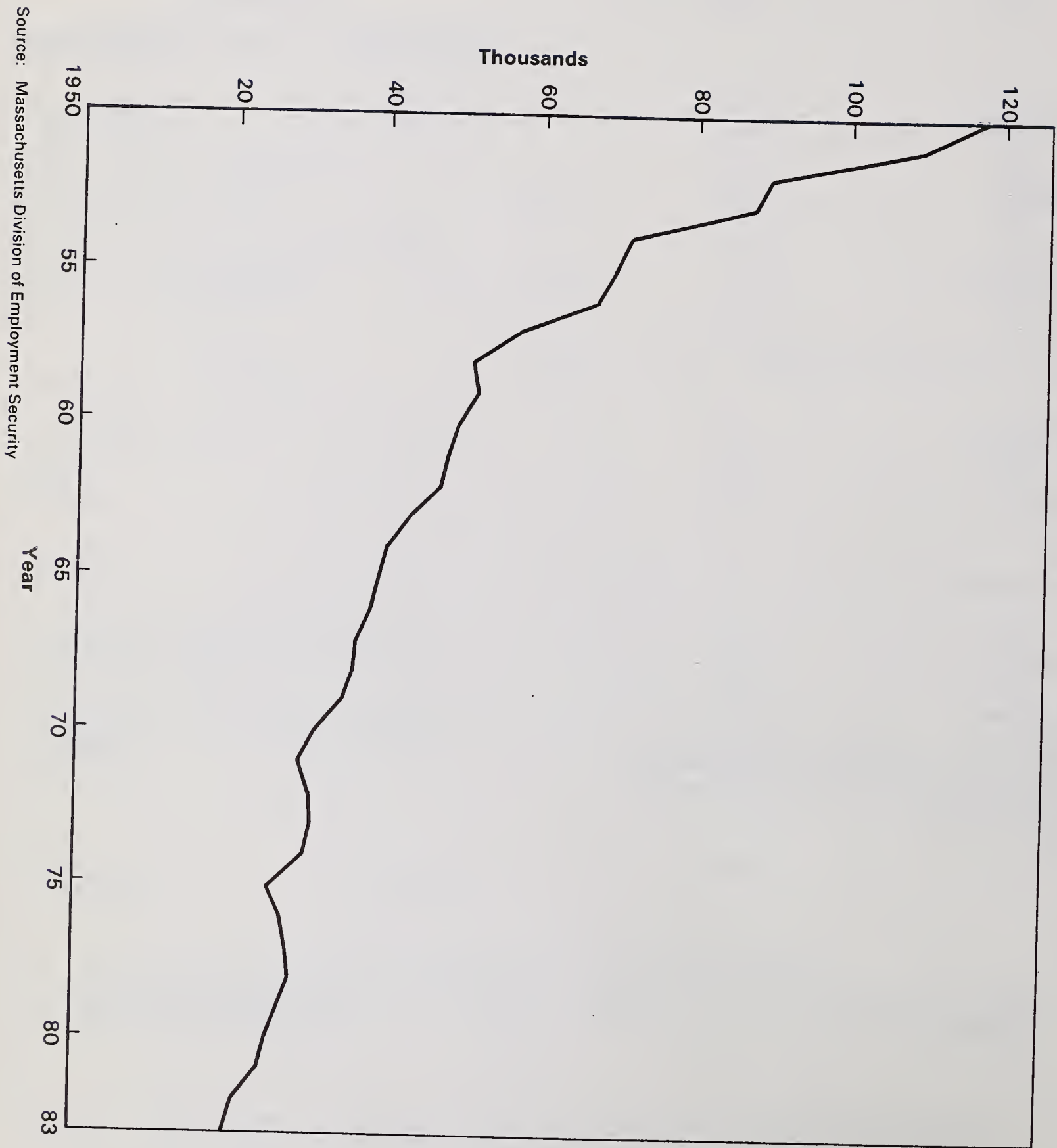


**EXHIBIT 6**  
**Textile Industry Employment Structure**

	<u>MASSACHUSETTS</u>	<u>UNITED STATES</u>
Weaving Mills	27.9%	32.6%
Cotton	1.0%	13.7%
Synthetics	16.4%	17.0%
Wool (including finishing)	10.5%	1.9%
Knitting Mills	20.0%	27.4%
Finishing	20.6%	8.0%
Floor Coverings	.5%	6.1%
Yarn and Thread Mills	7.0%	15.5%
Miscellaneous (includes: felt, padding, upholstery, processed textile waste, coated fabrics, scouring, combing and other non-wovens, cordage and twine)	<u>20.4%</u>	<u>10.4%</u>
TOTAL	100.0%	100.0%

Source: United States Department of Commerce, Bureau of the Census, County Business Patterns, 1981

**EXHIBIT 7**  
**Massachusetts Employment in the Textile Industry**





**EXHIBIT 8**  
**Massachusetts' Share of United States Textile Employment**

TOTAL INDUSTRY	3.0%
Weaving Mills, Cotton	.2%
Weaving & Finishing, Wool	17.1%
Narrow Fabrics	6.4%
Knitting Mills	2.2%
Textile Finishing, except Wool	7.9%
Floor Covering	.2%
Yarn and Thread Mills	1.4%
Miscellaneous	7.1%

Source: United States Department of Commerce, Bureau of  
the Census, County Business Patterns, 1981





# PLANT CLOSINGS AND MASS LAYOFFS IN MASSACHUSETTS

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## APPENDIX C

### REPORT OF THE GOVERNOR'S COMMISSION ON THE FUTURE OF MATURE INDUSTRIES

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Michael S. Dukakis  
Governor  
June 1984





## PLANT CLOSINGS AND MASS LAYOFFS IN MASSACHUSETTS

In its effort to understand the phenomenon of business closings and mass layoffs, the Commission undertook one of the most comprehensive state-wide studies of these occurrences conducted to date. Its study of plant closings covered all Massachusetts businesses or facilities employing over 50 full-time workers which closed between January 1982 and December 1983. This work involved the creation of its own data base. Besides summarizing the findings of this research, this Appendix also includes information on mass layoffs, based on a Massachusetts Division of Employment Security study covering eight months in 1983.

### PLANT CLOSINGS

#### Methodology

The Commission compiled its list of plant closures from the Massachusetts Division of Employment Security; a survey of local newspapers; and letters or telephone calls to unions, local Chambers of Commerce, and State legislators. The following definitions were used to structure the data base:

- Business Closure: A business which ceased its primary business activity at a given location in the Commonwealth. A business was considered closed even when a few personnel were retained to vacate property, dispose of inventory or otherwise carry out activities directly related to the closure.
- Time Period: Establishments which ceased operations between January 1, 1982 and December 1, 1983.
- Sector: Manufacturing and non-manufacturing establishments other than social service and public sector employers.
- Size: Establishments with over 50 full-time employees in the six month period prior to the closing.
- Job Loss: Measured in two ways:
  - the number of workers who lost their jobs at the time of the closing and

- the peak number of workers at the facility during the year prior to the closing.
- Multi-Plant Company: Any company which operated facilities at more than one location.
- Relocation/Consolidation: Any closing where the parent company or owners continued to produce the same product or service at a different location after the closing, and transferred or consolidated production or assets of the closed facility.
- Out-of-Business: Any closing where the production of goods or services was terminated at all of the company's facilities. Thus, if the company sold its customer list or product brand names and ceased production, went bankrupt or liquidated its assets, it was classified as being out-of-business.

A questionnaire was developed using these definitions and interviews concerning the closed facilities were conducted by phone. Interviews were with senior executives of the closed facility and the parent company, union representatives, and local chambers of Commerce. In almost every case, the information was able to be verified by two knowledgeable parties.

The results of this survey need to be qualified by the following points:

- Non-manufacturing establishments are under-represented for two reasons. In many cases, large numbers of their employees are part-time; therefore many of these establishments did not meet the size definition. There are also fewer sources of information about such closings since they are often non-union workplaces and since their closures do not generate the same level of media coverage as manufacturing operations.
- Attempts were made to eliminate companies which reopened at the same facility under the same or different ownership almost immediately after the closings and which retained most of the employees. It is possible that some of these cases were missed, particularly in the apparel industry, where there were a number of "overnight" closings and reopenings.
- The survey does not cover a full two-year period. At least two closings which occurred



in December 1983 were not included in the data base.

### Findings

Sixty-seven plant or business closings, affecting over 50 full-time employees, occurred between January 1982 and December 1983. Of these, 36 companies closed in 1982 and 31 closed in 1983. In total, 8,645 workers lost their jobs at the time of the closings; 12,368 workers had been employed at these facilities in the year preceding the closings.

Some general characteristics of the closings include the following:

- Twenty (31%) of the facilities were single plant companies; 45 (69%) of the establishments were part of a multi-plant company.
- Thirty-one (48%) of the establishments were owned by out-of-state corporations.
- Forty-two (65%) of the establishments were unionized.

These statistics suggest some specific characteristics of facilities that have closed. For example, these statistics suggest that shutdowns may be more likely to occur in multi-plant companies, facilities owned by out-of-state corporations, and companies that are unionized. However, to draw these conclusions, it would be necessary to know whether these factors simply reflect characteristics of the entire base of businesses in the Commonwealth or indeed indicate a definite pattern. Relevant data on the state's business base, however, is not currently available; therefore no conclusions can be drawn at this time.

Plant Closings By Industry: Summary findings of plant closings by industry include the following:

- Fifty-nine (91%) of the companies identified were in the manufacturing sector.
- The greatest number of closings occurred in the apparel (15 or 22% of all closings) and leather products (seven or 10% of all closings) industries. Exhibits 1 and 2 present the distribution of plant closings and job losses by industry.
- In terms of job losses, again, employees in the apparel industry were the most affected by plant closings: 16% of the total employment

loss was in the apparel industry. Other industries with large job losses were general merchandise stores (due to the Kings Department Stores closings) and leather products (primarily shoes).

- In those industries employing a significant number of metalworkers, 1,922 jobs were lost. This suggests that metal machining occupations have been seriously affected by plant closings.

Data on total job loss by industry--as a percent of total statewide employment in that industry--provides a clearer picture of those industries which have been most affected by plant closings (Exhibit 2). A loss of 489 jobs in the furniture and fixtures industry had the greatest relative impact on industry-wide employment. In this case, total job loss accounted for 6.3% of total employment in that industry. Similarly, the magnitude of the job loss in the apparel and leather goods industries becomes more evident. Almost 5% of all the workers in the apparel industry and 6% in the leather goods industry lost their jobs because of plant closings during this 23 month period.

These data confirm general impressions about which industries are most affected by plant closings. Clearly, plant closings have had the most serious impact on mature manufacturing industries. In particular, apparel, textiles, leather goods, and furniture have been hard-hit by closings relative to their employment size.

Closings By Location: The number of closings and the numbers of jobs lost due to closings were broken down by state labor market areas (LMAs) (Exhibit 3). The Massachusetts Division of Employment Security defines an LMA as an "economically integrated unit within which workers may readily change jobs without changing their place of residence." The LMA is the area in which laidoff workers are most likely to seek alternative employment; thus it is an appropriate geographic boundary for the purposes of this analysis.

The greatest percentage of peak level jobs lost due to closings (32% of the total) occurred in the Boston LMA. Although the absolute number of jobs lost is high, the Boston LMA lost one of the smallest percentages of its total employment base to closings: .3%. Because the Boston LMA accounts for 56% of total state employment, jobs lost due to closings were disproportionately small in this region.

In contrast, the Ware LMA lost 7% of its total employment base through closings, although it sustained a loss of only 230 jobs. It is likely that a dislocated worker



in the Ware LMA will have a harder time finding employment than a similar worker located in the Boston LMA.

Other hard-hit LMAs include Gardner, where 4% of its employment base was lost and the Clinton and New Bedford LMAs which lost nearly 3% of their employment due to closings during 1982 and 1983.

Type And Cause of Closings: Closings were divided into six categories:

- Multi-plant companies relocating or consolidating out-of-state
- Multi-plant companies relocating or consolidating within the state
- Multi-plant companies going out-of-business
- Single-plant companies relocating or consolidating out-of-state
- Single-plant companies relocating or consolidating within the state; and
- Single-plant companies going out-of-business.

Exhibit 4 presents closings by these categories. Analysis of this data reveals the following:

- Approximately 32% of closings were the result of relocations or consolidations occurring outside Massachusetts. The relocation sites were primarily in Northeastern and Midwestern industrial states. Only five of these 21 companies consolidated in or relocated to the Sunbelt. Eight of the relocations were back to the home state of the parent corporation (Exhibit 5).
- Five companies relocated to New Hampshire. Of these, only one continued to employ workers from Massachusetts.
- Sixty percent of the plants which closed were part of companies that went out-of-business entirely.
- There were five relocations within Massachusetts. Most of these resulted in a net employment loss, since employment at the new site was below that at the old site, or the relocation was a consolidation with no increase in employment.



- Of the single-plant companies which went out of business, 43% were in the apparel industry. It appears that the Massachusetts apparel industry is no longer affected by relocations to the South, as much as by bankruptcies and liquidations. Only one of the apparel company closings was the result of a consolidation of operations to a Southern plant.

Causes Of Closings: The Commission's survey included questions on the cause of the closing. Answers represented the perceptions of those asked. Owners often portrayed the closing as the inevitable response to declining demand, high interest rates, or import competition. Others described a history of disinvestment and/or bad management decisions. To understand what really occurred would require a detailed analysis of both the industry and the particular company, both of which was beyond the scope of the Commission.

The survey results, however, do reveal two general situations which typify many closings. The first "type" represents many apparel, textile, and shoe companies characterized by aging owners, old facilities, labor unrest, and import competition. These companies were generally locally owned, single-plant operations which went out of business due to management's failure to adjust to very difficult market conditions.

The second "type" of closing occurred in corporate subsidiaries which were closed by the parent corporation as part of a consolidation. Many of these companies were in the metalworking machinery and electrical equipment industries. In many cases, it was clear that the parent company had been disinvesting in the Massachusetts subsidiary for some time. In other cases, there was a real attempt to make the Massachusetts subsidiary a viable establishment, but market forces and/or more favorable production conditions in other corporate facilities resulted in the decision to consolidate operations elsewhere.

The Plant Closing Process--Provision Of Notice: There has been a heated debate both nationally and within Massachusetts about the costs and benefits of requiring companies to provide workers and the state with advance notice of their decision to close. As of November 1983, only two states--Maine and Wisconsin--and two Pennsylvania cities have laws which require advance notice (Exhibit 6). Enforcement of these laws has been relatively weak. Legislation requiring some form of advance notification has been proposed in about 38 states, including Massachusetts. Surprisingly, given this broad interest, there is little--if any--empirical research on general business behavior regarding plant closings.



One of the major objectives of the Commission's survey was to understand business practices regarding plant closing notification. Those interviewed in the Commission's survey were asked when employees were officially notified of the closing. Sometimes there was ambiguity about what constituted notice. In a few cases, a company continued to operate after filing for a Chapter 11 bankruptcy. In these cases, the time of the filing was defined as notice. Although there was no official notice in other cases, many employees were aware of an impending shutdown through rumors or because new orders slowed or stopped. These few cases were considered notice of less than one month, since workers received no clear indication of when the closings would occur. Given these qualifications, a summary of the findings include:

- Twenty-six of the companies (40%) provided less than one month's notice (Exhibit 7); Of the cases where the length of notice was known, 3,094 (44%) of the employees received less than one month's notice (Exhibit 8); 71% of the employees received less than three months' notice.
- Twenty-one (33%) of the companies provided over three months notice; 28% of the employees received more than three months notice.
- Seventy percent of the single-plant companies provided less than one month's notice, as compared to only 27% of the multi-plant companies (Exhibit 7).
- Sixty-nine percent of the companies giving less than one month's notice were ones which went out of business. Companies which consolidated or relocated plants were likely to provide more notice to their employees. One third of the multi-plant companies that relocated out-of-state gave over six months notice (Exhibit 9).
- Of the employees that received less than one month's notice, 30% were in the apparel industry, 7% were in the textile industry, and 14% were in the leather goods industry (Exhibit 10). Thirty-one percent of the employees receiving less than one month's notice were in non-manufacturing companies.

These data indicate that certain employers are more likely to give notice than others. The data suggest that companies going out of business, single plant companies, and companies in seriously declining industries such as apparel



and shoes are the companies most likely to provide little notice of a plant shutdown. The reasons for this are not clear, but there is some evidence from survey responses that companies with these characteristics are less likely to know well in advance that they will have to close. These companies may also be more likely to experience a loss of customers and increased demands by creditors once notice is given.

Conversely, companies which are relocating appear likely to provide more notice, since relocation or consolidation decisions are usually made with significant advance planning. Multi-plant companies in general may make closing decisions more in advance of a shutdown, since it requires a corporate decision involving the larger organization.

The Aftermath Of Closings: The Commission was interested in tracing post-shutdown employment experience and plant reuse to understand what happens to communities and employees affected by closings. Case studies and a survey on plant reuse were undertaken in an attempt to learn more about the impact of plant closings.

A survey of local officials found that 50% of the closings occurred in businesses located in 19th century mills and only 17% of the closings were in facilities built after 1945. In terms of ownership, 50% of the plants were owner-occupied and 50% were leased at the time of closing.

The survey revealed that despite the recent serious recession and the age and ownership characteristics of the plants, fewer than 30% of the idled plants remained for sale or lease by January of 1984. Of the 44 plants identified, only seven might fairly be called "white elephants": they have over 100,000 square feet, are old, and still remain vacant. For the most part, plants continued to be used in heavy or light manufacturing.

Local and state economic development officials were actively involved in finding new uses for idle plants. Economic development assistance to encourage the reuse of vacant plants included marketing aid, industrial revenue bond financing, use of Federal Urban Development Action Grants, Community Development Block Grants, Federal Historic Rehabilitation tax credits, infrastructure improvements, and zoning changes. These efforts were important in promoting the productive reuse of the closed plants.

Information about the status and employment history of the workers who lost their jobs due to these plant closings is extremely difficult to uncover. Although there is no available comprehensive data, case studies and anecdotal evidence from the plant closing survey did provide a general



picture of the likely impacts of a plant closing on employees:

- Workers displaced from jobs in heavy industry often have to choose between early retirement and lower paying jobs.
- Workers in the apparel industry had a better chance of finding comparable work for comparable pay. Many of the closed apparel shops were replaced, at least in part, by other garment manufacturers who moved into the same facilities.
- Firms which moved into formerly closed facilities tended to pay lower wages than the prior business.
- The amount of notice given did not necessarily increase the likelihood or timing of re-employment. The structure of the industry, conditions in the local economy, and workforce characteristics were more critical factors in the ability of an employee to find similar work at comparable wages. Older, less skilled workers, in areas with limited employment opportunities faced the most serious obstacles in finding comparable new jobs.

#### PERMANENT AND INDEFINITE LAYOFFS

Another source of worker dislocation is layoffs. There are two major types of layoffs:

- short-term layoffs - caused by seasonal fluctuations in a business, product line retooling and other usually planned-for factors in which the likelihood of rehires is high and the layoff period is known and usually short and
- permanent and indefinite layoffs - in which the layoff period may be indeterminate at best or permanent, as a result of national economic or competitive factors.

Because permanent and indefinite layoffs can affect workers as profoundly as plant closings and sometimes precede the closing of a facility, the Commission was concerned about their magnitude. Data on permanent and indefinite layoffs are not compiled in any consistent or comprehensive form. The Massachusetts Division of Employment Security (DES) did, however, conduct a special study of permanent and indefinite layoffs affecting 25 or more workers occurring between January



and August 1983. The DES data provide a "snapshot" of the industries, workers, and labor market areas affected by permanent and indefinite layoffs. It is limited in that it does not show:

- workers recalled from the layoffs over the same time period and
- workers laid off prior to January 1983 and still unemployed during the data collection period.

According to the DES data, layoffs occurred far more often and affected more workers than plant closings during this period:

- A total of 72 firms laid off 11,696 workers between January and August 1983. This compares with 8,492 workers who lost their jobs from closings between January of 1982 and December 1983, a period twice as long.
- Twenty-seven (37%) of the layoffs affected 100 or more workers at one site and layoffs of over 100 workers accounted for 9,607 (82%) of all workers laid off (Exhibit 11).

While plant closings occurred primarily in the apparel and shoe industries, layoffs were concentrated in fabricated metals, machinery and instrument industries (Exhibit 12). When broken down in more detail, the data show that high technology industries, which play a minor role in plant closings, account for more than half of the laidoff workers (Exhibit 13).

The regional concentration of the above industries meant that the Boston, Worcester and Pittsfield LMAs accounted for 78% of the laidoff workers. Even so, the regional impact was limited except in the case of Pittsfield, where layoffs affected 4% of the labor force during an eight month period (Exhibit 14).

#### The Layoff Process

DES's study was a quantitative assessment of the magnitude of permanent and indefinite layoffs in the state's economy. In order to develop a more qualitative understanding of the process underlying a layoff decision, Commission staff interviewed 25 companies that experienced a permanent or indefinite layoff in 1982 or 1983. These companies do not constitute a statistically representative sample. They were companies in the machinery sector that had layoffs of over 20 workers. The following discussion covers these 25 layoff instances which probably depict the general



characteristics of the layoff process in the machinery sector.

Two main reasons emerge for a firm to have a layoff. One was a response to a cyclical downturn in the economy. This was the cause of 20 of the layoffs. The discontinuation of a product line (a long-term management decision) resulted in four layoff situations.

Once these companies decided to lay off workers, it was done with minimal notice. Of the 20 firms who laid off workers because of the economic downturn, one-half gave less than one week's notice and no firm gave over one month. However, because these firms expected to rehire the same workers, they tried to help them to adjust to the abruptness of the layoff. Such assistance ranged from maintaining regular contact to extending benefits packages. At the time of this survey (December 1983), 18 of the 20 firms had begun to recall workers. While the relatively high wages paid by the firms surveyed would tend to encourage people to wait for recall, how the layoff was implemented did influence the company's ability to hire workers.

The four firms which laid off workers because of product line discontinuations tended to give more notice than companies contracting operations because of the recession. This was in part because these four firms were facing situations which involved advance planning and had the ability to give workers more notice.

## CONCLUSIONS

Consistent and effective policies to address the problems of plant closings and mass layoffs need to be based on an understanding of which communities, individuals and industries are being affected and the magnitude of the problem. Currently, there is very little reliable data of this type. The work of the Commission is only a beginning.

The data assembled has increased the understanding of the plant closing and layoff phenomenon in Massachusetts. The analysis showed that during the period studied, the impact of plant closings on the Commonwealth as a whole was not significant relative to the employment base of the state. However, it was very significant for a few communities and a few industries. The problem therefore should be viewed on a geographic or industry basis.

The Commission's research also found that indefinite layoffs have a very different typology than plant closings. In fact, layoffs were as frequent among high technology industries as among mature industries during this eight month period. They are caused primarily by business cycle

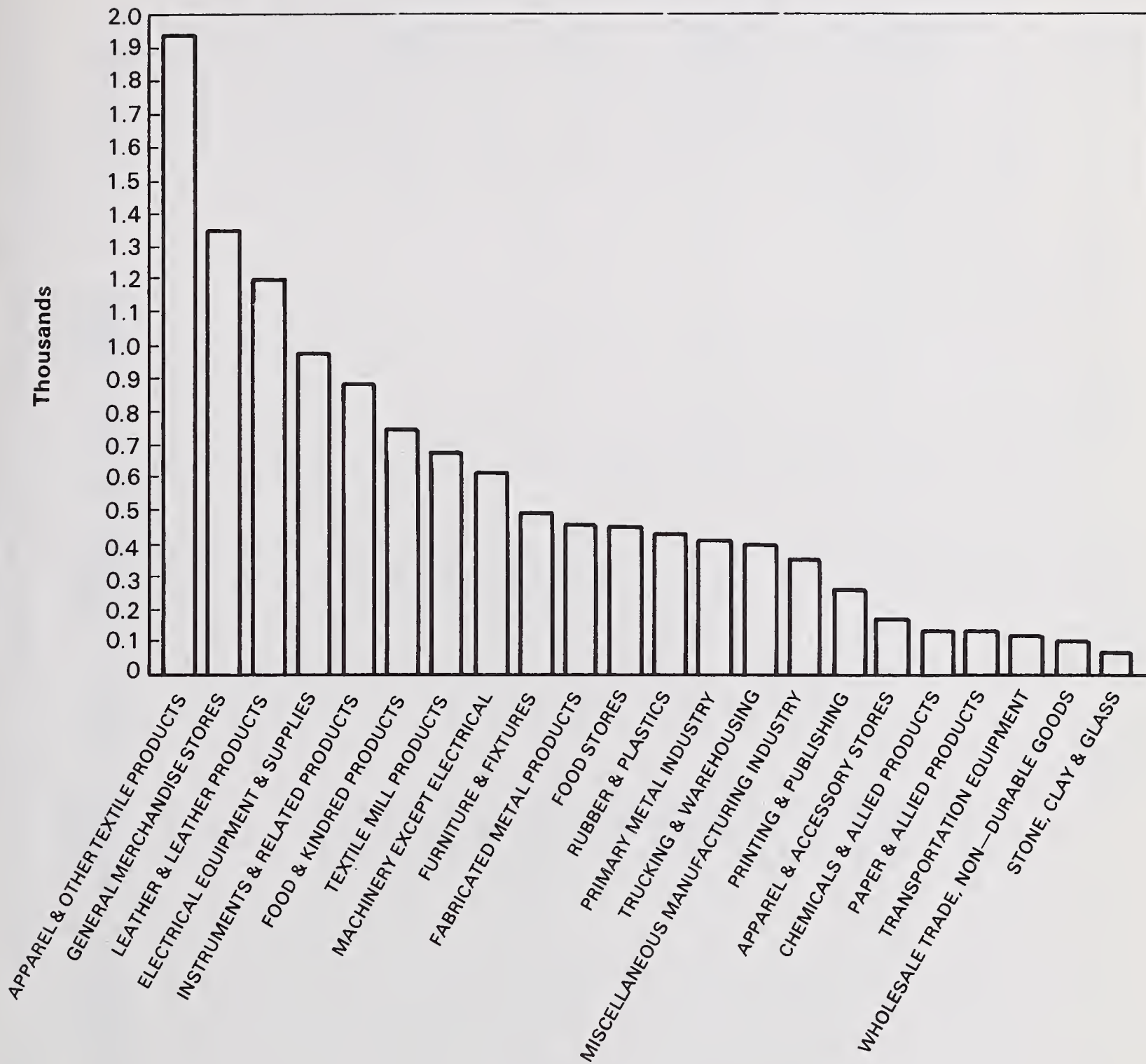
downturns, they are preceded by much shorter notice lengths than closings and they often result in workers being recalled at a later date. Policies appropriate for plant closings may not be appropriate in a layoff situation.

Again, it must be emphasized that this survey covered a period of time characterized by a recession. Layoffs or closings of small companies were not included. As a result, the numbers presented should not be used as the sole means of characterizing the plant closing phenomenon in Massachusetts. Smaller plant closings could have a devastating impact in the smaller industrial cities and towns of the Commonwealth. Given that the time period covered was one in which business bankruptcies reached an historic high, it is likely that including business closings of under 50 employees would have provided a very different picture of the magnitude of the problem.

In the future, it is important that plant closings and major layoffs are tracked by the state in a more precise and consistent manner. This information is critical in the design of regionally based economic development programs. It would also be helpful in planning the provision of state human resource, employment, and training services to workers who have lost their jobs.



# **EXHIBIT 1** **Layoffs Due to Closings\***



\* Covers January 1982 to December 1983: Closings affecting over 50 full-time employees in Massachusetts

Source: Governor's Commission on the Future of Mature Industries

# **EXHIBIT 2** **Plant Closings in Massachusetts by Industry January 1, 1982 - December 1, 1983\***

SIC	INDUSTRY NAME	NUMBER OF CLOSED FACILITIES	% OF CLOSED FACILITIES	PEAK # OF EMPLOYEES LOSING JOBS	% OF TOTAL JOB LOSS	TOTAL 1982 INDUSTRY EMPLOYMENT IN MASSACHUSETTS	JOB LOSS AS % OF TOTAL EMPLOYMENT IN SIC	INDUSTRY EMPLOYMENT AS % OF TOTAL STATE EMPLOYMENT
20	Food & Kindred Products	5	7.5%	742	6.0%	25,550	2.9%	1.1%
22	Textile Mill Products	2	3.0%	680	5.5%	23,582	2.9%	1.1%
23	Apparel	15	22.4%	1,941	15.7%	39,635	4.9%	1.8%
25	Furniture & Fixtures	2	3.0%	489	4.0%	7,731	6.3%	.4%
26	Paper & Allied Products	1	1.5%	130	1.5%	27,206	.5%	1.2%
27	Printing & Publishing	2	3.0%	260	2.5%	44,483	.6%	2.0%
28	Chemicals & Allied Products	1	1.5%	133	1.1%	18,341	.7%	.8%
30	Rubber & Miscellaneous Plastic Products	3	4.5%	430	3.5%	29,739	1.4%	1.3%
31	Leather & Leather Products	7	10.4%	1,215	9.8%	20,907	5.8%	.9%
32	Stone, Clay, Glass & Concrete Products	1	1.5%	65	.5%	12,854	.5%	.6%
33	Primary Metal Industries	3	4.5%	412	3.3%	17,262	2.4%	.8%
34	Fabricated Metal	3	4.5%	454	3.7%	51,494	.9%	2.3%
35	Machinery except Electric	4	6.0%	612	4.9%	111,460	.5%	5.0%
36	Electrical & Electronic	4	6.0%	980	7.9%	111,407	.9%	5.0%
37	Transportation Equipment	1	1.5%	120	.9%	33,257	.4%	1.5%
38	Measuring, Analyzing & Controlling	5	2.5%	885	7.2%	61,313	1.4%	2.7%
39	Miscellaneous Manufacturing	2	3.0%	350	2.8%	25,663	1.4%	1.1%
42	Motor Freight Transport	1	1.5%	400	3.2%	59,816**	.7%	2.7%
51	Wholesale Trade - Nondurable	1	1.5%	100	.8%	132,428***	.1%	5.9%
53	General Merchandise Stores	1	1.5%	1,350	10.9%			
54	Food Stores	1	1.5%	450	3.6%	450,023****	.4%	20.1%
56	Apparel & Accessories Stores	2	3.0%	170	1.4%			
TOTAL		67	100.0%	12,369	100.00%			

\* Includes closings affecting over 50 full-time employees.  
 \*\* Includes SICs 40 - 47.

\*\*\* Includes SICs 50 & 51.  
 \*\*\*\* Includes SICs 52 - 59.

Totals may not sum due to rounding.

Source: Governor's Commission on the Future of Mature Industries



### EXHIBIT 3 Plant Closings by Location

<u>LABOR MARKET AREA</u>	<u>NUMBER OF CLOSINGS</u>	<u>PEAK JOB LOSS</u>	<u>PERCENT OF TOTAL JOB LOSS</u>	<u>PRIVATE SECTOR TOTAL 1981 EMPLOYMENT</u>	<u>JOB LOSS/ EMPLOYMENT IN LMA</u>
Athol	-	-	-	6,927	-
Barnstable	1	70	.6%	45,608	.2%
Boston (SMSA)	22	3,505	31.8%	1,256,820	.3%
Brockton	3	227	2.1%	45,143	.5%
Clinton	1	150	1.4%	6,098	2.5%
Dukes County	-	-	-	3,001	-
Fall River	2	200	1.8%	46,182	.4%
Fitchburg-Leominster (SMSA)	3	370	3.4%	34,791	1.1%
Gardner	2	495	4.5%	11,639	4.3%
Gloucester	1	100	.9%	13,329	.7%
Great Barrington	-	-	-	4,729	-
Greenfield	-	-	-	15,140	-
Lawrence-Haverhill	2	500	4.5%	85,965	.6%
Lowell	5	1,271	11.5%	65,954	1.9%
Marlboro	1	250	2.3%	36,321	.7%
Milford	-	-	-	9,143	-
Nantucket	-	-	-	2,235	-
New Bedford	5	1,400	12.7%	56,124	2.5%
Newburyport	1	135	1.2%	7,595	1.8%
Pittsfield	1	150	1.4%	45,955	.3%
Plymouth	-	-	-	16,776	-
Southbridge	1	120	1.1%	11,778	1.0%
Springfield-Chicopee-Holyoke	5	690	6.3%	185,098	.4%
Taunton	1	133	1.2%	15,448	.9%
Ware	1	230	2.1%	3,315	6.9%
Worcester	6	757	6.9%	141,353	.5%
Balance of State	2	265	2.4%	31,977	.8%
Massachusetts share of Rhode Island	-	-	-	36,061	-
TOTAL	66	11,018	100.0%	2,240,464	.5%

The figures do not include King's Department Stores since they were in many locations.  
Source: Governor's Commission on the Future of Mature Industries

**EXHIBIT 4**  
**Closings by Type**

	<u>NUMBER OF COMPANIES</u>	<u>PERCENT OF CLOSINGS</u>
Multi-Plant Relocation or Consolidation Out of State	21	32.3%
Multi-Plant Relocation or Consolidation Within State	3	4.6%
Multi-Plant Out of Business	21	32.3%
Single Plant Relocation Out of State	0	0.0%
Single Plant Relocation or Consolidation Within State	2	3.0%
Single Plant Out of Business	18	27.8%
	—	—
	65*	100.0%

\* Unknown for two firms.

Source: Governor's Commission on the Future of Mature Industries



**EXHIBIT 5**  
**Site of Relocation or Consolidation**

<u>LOCATION</u>	<u># OF FACILITIES*</u>
New York	2
New Hampshire	5
Illinois	1
Ohio	3
New Jersey	1
Pennsylvania	3
Tennessee	2
Wisconsin	1
North Carolina	2
South Carolina	1
Missouri	1
	—
TOTAL	22

\* This figure is greater than the 21 relocations since, in one case, assets were relocated to more than one location.

Source: Governor's Commission on the Future of Mature Industries

# **EXHIBIT 6** **Existing Plant Closing Legislation (November 1983)** **United States, States and Municipal Governments**

<u>STATE AND LOCAL GOVERNMENT</u>	<u>NOTICE REQUIRED, AFFECTED EMPLOYEES</u>	<u>ACTION COVERED/EMPLOYEE COVERED</u>	<u>COPY OF NOTICE TO:</u>	<u>ENFORCEMENT PROVISIONS</u>
Maine 1971 (strengthened 1981)	100 or more employees any time in the preceding 12 months; 60 days.	Any company which terminates operations in a covered establishment, or relocates such operations, in or out of Maine, 100 or more miles from the original location.	Director of Bureau of Labor Standards (who keeps such notice confidential), employees and town officials only for relocation out of state. (Added in 1981.)	No penalty for failure to notify Director. Maximum \$500 for failure to notify workforce and town officials. Full payment of required severance pay, when such pay is not forthcoming.
Wisconsin 1975	100 or more employees: 60 days.	If firm considering a merger, relocation, liquidation or disposition of assets.	State Department of Labor, Industry and Human Relations.	Maximum of \$50 for each employee.
Wisconsin 1983	100 or more employees: 60 days.	Cessation of business activities.	State Department of Development and Council of Economic Adjustment.	None.
Philadelphia December 1982	50 or more employees: 60 days.	An entity that has employed at least 50 workers at any time in the preceding year. Closing defined as permanent shutdown for any reason other than bankruptcy and physical calamity, including relocation outside community distance.	Director of Commerce of city, affected employees or employee organizations.	Employer can be enjoined until employer has given proper notice. If the employer violates the notice, court shall award to each affected employee an amount equal to daily wage times number of days short of 60 days in which notice is not provided.
Pittsburgh 1981	10 - 100 employees: 90 days; 101-500 employees: 180 days; 501 employees or any more: 270 days.	Firms which close, relocate or layoff 15% or more of the workforce.		
Connecticut 1983	100 or more employees.			



# EXHIBIT 6 (continued)

STATE AND LOCAL GOVERNMENT	EMPLOYEE BENEFITS	EMPLOYEES COVERED BY BENEFITS	STATE ACTIONS REQUIRED/PERMITTED	COMPENSATION BY COMPANY TO COMMUNITY	STATUS
Maine 1971 (strengthened 1981)	1 week for each year employed, except: closure due to physical calamity; company has official policy to pro- vide some form of severance pay even if such pay is less generous than the state's requirement; employee accepts employment at new location; or quits before being officially laid off.	All employees employed 1 year or more.	Authority to examine books and records to determine that proper severance pay is paid.		Since the passage of the 1981 amendment requiring notice to workers in cases of relocation, no closures have occurred which would have triggered such notice. Only about 10% of firms which have closed establishments provide adequate notice to the Director. About 85% of firms closing have complied with the requirements of severance pay provisions of the law.
Wisconsin 1975			State Department of Labor, Industry and Human Relations may require the employer to set out the manner of final payments to employees.	Employer must submit information on payroll, number of employees and wages.	Law is essentially not en- forced since enacted. Suit filed by Wisconsin manufac- turers and Commerce Associa- tion in 1976 against enforcement. Suit dropped when Department agreed to file legislation to repeal the law. Efforts to repeal unsuccessful to date. Currently new efforts by legislature and Administra- tion to revise.
Wisconsin 1983			State will set up Economic Adjustment Team to provide technical assistance and coordinate assistance to dislocated workers.		
Philadelphia December 1982				Efforts by employer to find suitable employment for affected employees.	Became effective in February 1983.
Pittsburgh 1981					
Connecticut 1983	Extends health and medical benefits for 90 days.				Ruled illegal by county level court. Currently under appeal.

**EXHIBIT 7**  
**Notice Length by Type of Company\***

	<u>MULTI-PLANT</u>	<u>PERCENT MULTI-PLANT</u>	<u>SINGLE PLANT</u>	<u>PERCENT SINGLE PLANT</u>
Unknown	1	2.2%	1	5%
Less One Month	12	26.7%	14	70%
One - Three Months	14	31.1%	2	10%
Three - Six Months	9	20.0%	3	15%
Six Months Plus	<u>9</u>	<u>20.0%</u>	<u>0</u>	<u>0%</u>
	45	100.0%	20	100%

\* Only includes cases where type of closing is known.

Source: Governor's Commission on the Future of Mature Industries



**EXHIBIT 8**  
**Notice Length and Job Loss**

<u>NOTICE LENGTH</u>	<u>WORKERS</u>	<u>PERCENT</u>
Less One Month	3094	43.9%
One - Three Months	1905	27.0%
Three - Six Months	1157	16.4%
Six Months Plus	<u>892</u>	<u>12.7%</u>
	7048*	100.0%

\* Only includes cases where notice is known.

Source: Governor's Commission on the Future of Mature Industries

**EXHIBIT 9**  
**Notice Length by Type of Closing \***

	<u>UNKNOWN</u>	<u>LESS 1 MONTH</u>	<u>1 - 3 MONTHS</u>	<u>3 - 6 MONTHS</u>	<u>6 MONTHS PLUS</u>
Multi-Plant Company, Out of State, Consolidation or Relocation	0.0%	28.6%	19.0%	19.0%	33.3%
Multi-Plant Company, Within State, Consolidation or Relocation	0.0%	66.7%	33.3%	0.0%	0.0%
Multi-Plant Company, Out of Business	4.8%	23.8%	42.8%	23.8%	4.8%
Single Plant Company, Out of Business	0.0%	72.0%	11.3%	16.7%	0.0%
Single Plant Company, Within State, Relocation	50.0%	0.0%	0.0%	50.0%	0.0%

\* Only includes cases where type of closing is known.

Source: Governor's Commission on the Future of Mature Industries



# **EXHIBIT 10** **Distribution of Notice by SIC (Number of Jobs at Closing)**

	UNKNOWN	LESS 1 MONTH	1 - 3 MONTHS	3 - 6 MONTHS	6 MONTHS PLUS
Food and Kindred Products	0.0%	0.7%	10.0%	0.0%	17.7%
Textile Mill Products	0.0%	6.5%	2.6%	0.0%	0.0%
Apparel and other Textile Products	6.5%	29.5%	18.4%	19.2%	0.0%
Furniture and Fixtures	0.0%	2.8%	0.0%	13.0%	0.0%
Paper and Allied Products	0.0%	0.0%	3.9%	0.0%	0.0%
Printing and Publishing	0.0%	4.2%	0.0%	8.6%	0.0%
Chemicals and Allied Products	0.0%	0.0%	3.2%	0.0%	0.0%
Rubber and Plastics	0.0%	2.2%	2.6%	0.0%	22.5%
Leather and Leather Products	0.0%	13.8%	15.8%	0.0%	0.0%
Stone, Clay and Glass	0.0%	0.9%	0.0%	0.0%	0.0%
Primary Metal Industry	0.0%	0.0%	0.0%	6.7%	0.3%
Fabricated Metal Products	0.0%	0.0%	4.7%	6.9%	10.1%
Machinery except Electrical	0.0%	0.8%	0.0%	14.7%	11.6%
Electrical Equipment and Supplies	0.0%	0.0%	25.2%	0.0%	26.9%
Transportation Equipment	0.0%	0.0%	2.1%	0.0%	0.0%
Instruments and Related Products	0.0%	3.2%	2.6%	30.9%	0.0%
Miscellaneous Manufacturing	0.0%	4.9%	0.0%	0.0%	10.9%
Trucking and Warehousing	0.0%	12.9%	0.0%	0.0%	0.0%
Wholesale Trade Nondurable Goods	0.0%	3.2%	0.0%	0.0%	0.0%
General Merchandise Stores	93.5%	0.0%	0.0%	0.0%	0.0%
Food Stores	0.0%	14.5%	0.0%	0.0%	0.0%
Apparel and Accessory Stores	0.0%	0.0%	8.9%	0.0%	0.0%
	100.0%	100.0%	100.0%	100.0%	100.0%

Totals may not sum due to rounding.  
Source: Governor's Commission on the Future of Mature Industries

**EXHIBIT 11**  
**Massachusetts Business Layoffs\***  
**(January - August 1983)**

<u>SIZE CLASS:</u> <u>NUMBER OF WORKERS</u>	<u>NUMBER OF LAYOFFS</u>	<u>JOBS AFFECTED</u>
25 - 49	29	1,000
50 - 99	16	1,089
100 - 249	19	2,922
250 and over	<u>8</u>	<u>6,685</u>
TOTALS	72	11,696

\* Layoffs of less than 25 employees are not included in this report. Also, only those layoffs designated as either indefinite or permanent in nature are included.

Source: Massachusetts Division of Employment Security



# EXHIBIT 12

## Layoffs by Industry

SIC	INDUSTRY NAME	BUSINESS LAYOFFS	JOBS AFFECTED	TOTAL EMPLOYMENT (THOUSANDS)	LAYOFFS AS A % TOTAL EMPLOYMENT
17	Special Trade Contractors	1	25	49,511	.1%
20	Food and Kindred Products	4	326	25,445	1.0%
22	Textile Mill Products	2	204	20,214	1.0%
23	Apparel	3	146	37,471	.4%
27	Printing, Publishing and Allied Products	1	600	45,561	1.3%
30	Rubber and Miscellaneous Plastic	2	105	29,465	.4%
31	Leather and Leather Products	2	67	18,481	.4%
32	Stone, Clay, Glass and Concrete Products	4	690	11,731	6.0%
33	Primary Metal Industries	2	128	15,682	.9%
34	Fabricated Metal except Machining and Transportation	8	1,030	47,851	2.0%
35	Machinery except Electrical	13	3,653	105,990	3.4%
36	Electrical and Electronic	6	1,825	110,159	1.7%
38	Measuring, Analyzing and Controlling Instruments	6	830	59,687	1.4%
39	Miscellaneous Manufacturing Industries	2	80	23,885	.3%
50	Wholesale Trade - Durable Goods	3	100	70,671	.1%
51	Wholesale Trade - Nondurable Goods	2	123	60,510	.2%
53	General Merchandise Stores	1	60	59,995	.1%
59	Miscellaneous Retail	1	52	65,990	.1%
61	Credit Agencies other than Banks	1	123	9,953	1.3%
63	Insurance	1	900	50,229	2.0%
65	Real Estate	1	40	21,004	.2%
73	Business Services	2	115	121,957	.1%
80	Health Services	1	200	221,996	.1%
83	Social Services	2	74	39,538	.2%
89	Miscellaneous Services	1	200	42,349	.5%
	TOTALS	72	11,696		

Source: Massachusetts Division of Employment Security

Commission calculations

# **EXHIBIT 13** **Permanent and Indefinite Layoffs in the High Tech Sector**

	<u>THREE</u> <u>DIGIT SIC</u>	<u>NUMBER OF</u> <u>LAYOFFS</u>	<u>NUMBER OF</u> <u>WORKERS</u> <u>LAI D OFF</u>	<u>TOTAL</u> <u>MASSACHUSETTS</u> <u>EMPLOYMENT</u>	<u>NUMBER LAID OFF</u> <u>AS PERCENT OF</u> <u>TOTAL EMPLOYMENT</u>
Ordinance & Accessories	348	4	665	5,271	12.6%
Office Computing & Accounting Supplies	357	4	2,925	50,105	5.8%
Electrical & Industrial Apparatus	362	1	150	5,064	3.0%
Radio & Television Receivers	365	1	150	2,467	6.1%
Communications Equipment	366	3	1,460	33,577	4.3%
Electronic Components & Accessories	367	1	25	51,072	0.0%
Engineering & Scientific Instruments	381	1	109	3,908	2.8%
Medical Instruments & Supplies	384	2	360	8,155	4.4%
Ophthalmic Goods	385	2	161	4,776	3.4%
Watches, Clocks & Watch Cases	387	<u>1</u>	<u>200</u>	<u>1,090</u>	<u>18.3%</u>
TOTALS		20	6,205	165,485	3.8%

Source: Massachusetts Division of Employment Security

Governor's Commission on the Future of Mature Industries



# **EXHIBIT 14** **Layoffs by Labor Market Area**

<u>LABOR MARKET AREA</u>	<u>NUMBER OF BUSINESS LAYOFFS</u>	<u>JOBS AFFECTED</u>	<u>LAYOFFS AS % OF ALL LAYOFFS</u>	<u>JOBS LOST AS % OF TOTAL JOBS LOST</u>	<u>LMA EMPLOYMENT DECEMBER 1981</u>	<u>LAYOFFS AS % OF LMA EMPLOYMENT</u>
Athol	-	-	-	-	-	-
Barnstable County	-	-	-	-	-	-
Boston (SMSA)	23	6,010	32%	51%	1,256,820	.5%
Brockton (SMSA)	4	145	5%	1%	45,143	.3%
Clinton	-	-	-	-	-	-
Dukes County	-	-	-	-	-	-
Fall River	-	-	-	-	-	-
Fitchburg-Leominster (SMSA)	2	69	3%	41%	34,791	.2%
Gardner	2	160	3%	1%	11,639	1.4%
Gloucester	1	62	3%	41%	13,329	.5%
Great Barrington	-	-	-	-	-	-
Greenfield	1	30	2%	41%	15,140	.2%
Lawrence-Haverhill	2	72	3%	41%	85,965	.1%
Lowell	3	725	4%	6%	65,954	1.0%
Marlboro	-	-	-	-	-	-
Milford	-	-	-	-	-	-
Nantucket	-	-	-	-	-	-
New Bedford	2	97	3%	41%	56,124	.2%
Newburyport	-	-	-	-	-	-
Pittsfield	8	1,820	11%	15%	45,955	4.0%
Plymouth	-	-	-	-	-	-
Southbridge	1	117	2%	1%	11,778	1.0%
Springfield-Chicopee-Holyoke	6	786	8%	7%	185,098	.4%
Taunton	-	-	-	-	-	-
Ware	-	-	-	-	-	-
Worcester	14	1,377	18%	11%	141,353	1.0%
Balance of State	3	226	4%	2%	31,977	.7%
Massachusetts' share of Rhode Island	-	-	-	-	-	-
TOTALS	72	11,696	100%	100%	2,240,464	.5%

Source: Massachusetts Division of Employment  
Security





# PUBLIC SECTOR RESOURCES FOR BUSINESSES' FINANCIAL NEEDS

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## APPENDIX D

### REPORT OF THE GOVERNOR'S COMMISSION ON THE FUTURE OF MATURE INDUSTRIES

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Michael S. Dukakis  
Governor

June 1984





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## INTRODUCTION

In developing a comprehensive set of recommendations to promote the stabilization and growth of traditional manufacturing industries in Massachusetts, the Commission found one area of concern to be the availability of financing. Are firms financing needs adequately addressed by existing private and public institutions? Are there "capital gaps" which can be closed by new public sector programs? This report addresses these questions. In addition, since the Commission found that many in the business community are not aware of existing state and federal financing programs, it is hoped that this document can be used to publicize existing programs more effectively.

## BACKGROUND

The overwhelming proportion of capital and credit for business development and expansion is supplied by the retained earnings of corporations; by private sector financial institutions such as commercial banks, insurance companies, leasing companies and venture capitalists; and through public sources of capital. Private capital markets are extraordinarily diverse and respond quickly and efficiently to opportunities perceived to be profitable. This is especially true in Massachusetts, where private sector financial institutions are particularly sophisticated and active.

Yet, even in such a financially sophisticated state, experience has shown that "capital gaps" may develop. Sometimes, for a variety of reasons, the private sector fails to supply sufficient amounts of capital at acceptable market rates. For example, small businesses sometimes have trouble obtaining credit. Assessing the soundness of a loan is costly and banks find it more profitable to make larger loans. Raising small amounts of capital on the bond, commercial paper and stock markets is not economic because information, filing and legal costs can be high relative to the size of the financing.

Secondly, high risk sources of capital are only available when potential returns are high enough to justify the risk. As a result, loans for restructuring or new product or market development in mature companies are generally very hard to find from conventional sources. Finally, private financial institutions do not consider the social and fiscal (tax revenue) returns to lending situations. On a societal level, the capital markets, therefore, may not supply funds in situations where the total financial, social and fiscal returns justify an investment.



During the first Dukakis Administration, an extensive review of the financing needs of Massachusetts' businesses by the Governor's Task Force on Capital Formation for Economic Development, identified several areas where private capital markets were not providing sufficient amounts of certain important kinds of financing. At this time, the only quasi public finance institution was the Massachusetts Business Development Corporation, established by the State Legislature in 1953 to increase finance opportunities for small and medium-size businesses and local development authorities.

The final report of the Governor's Task Force on Capital Formation, released in January 1977, concluded that, while the Massachusetts capital markets generally worked well, "from a public policy standpoint, the costs and availability of capital may limit the creation or expansion of certain kinds of financing and, therefore, of jobs and tax revenue, which may be particularly important to the economy of the state."

The 33 member Task Force, consisting of representatives of business, finance, labor, government and academia, saw three elements as critical to any effort to revive the Commonwealth's economy and lower the unemployment rate which was then three to four percentage points higher than the national average. These were:

- the encouragement of innovative new ventures and the development of new technology-based products and processes
- the expansion of existing industry, particularly small and medium-sized companies; and
- the economic renewal of older cities and depressed small towns through the retention of existing firms and the attraction of new ones.

The Task Force recommended several new publicly created financing institutions to address these problems:

- Massachusetts Technology Development Corporation (MTDC) - to increase the supply of venture capital to technology-based businesses, working with the venture capital community, the high technology sector and Massachusetts universities
- Community Development Finance Corporation (CDFC) - (created in 1975 and capitalized in 1977) to assist in revitalizing depressed communities across the state, working with local community development organizations; and



- Massachusetts Industrial Finance Agency (MIFA) - to make long-term tax-exempt plant and equipment financing available to local manufacturing firms, working with commercial banks and the thrift industry.

While these recommendations were being made and acted upon, a compromise between the Commonwealth and the life insurance industry, centering on the corporate tax rate for domestic insurance companies, led to the creation by the Massachusetts insurance industry of another innovative, publicly chartered financial institution:

- Massachusetts Capital Resource Company (MCRC) - to provide intermediate and long-term subordinated loans and equity investment to smaller firms having difficulty gaining access to private capital markets.

These four institutions were all established by the end of 1978. The Task Force also recommended an oversight and coordinating agency, the Massachusetts Industrial Development Authority, but the State Legislature did not establish that authority. Today, although these various institutions cooperate informally and often participate together in financings, there is no formal overseeing and coordinating body.

In general, these institutions, along with the revitalized Massachusetts Business Development Corporation, are doing the jobs for which they were established. Each has adapted and modified its focus since 1978 in response to changes in the state and national economies and in the behavior of private capital markets. Most have identified and tried to fill particular roles and niches in the market place. These institutions have established strong internal systems and controls, are staffed by experienced professionals, and work well with other public and private financial institutions. They address clear public needs, and for the most part, have complemented, not competed with private market financing.

Much has changed in Massachusetts since 1977. Then a state with higher-than-average unemployment, Massachusetts now has the lowest unemployment rate of any of the nation's ten largest industrial states. Even so, the 1983 rate of 6.9% would have been considered unacceptably high a few years ago. The recovery, however, has been a very uneven one. Certain firms, industries and regions in the state continue to lag behind and have not benefited from recent years of dramatic expansion.

Today, the specific and often unique problems of firms in traditional industries are much clearer and more pressing



than they appeared in 1977. To some extent, the existing private, public and quasi-public institutions have adapted to the diverse financing needs of these firms for expansion, modernization, stabilization, innovation, research and development and ownership changes.

In addition, the institutions and programs mentioned above are not the only publicly sponsored ones to which firms in traditional (as well as high technology) industries can turn for financial assistance. There are other state and federal programs, including the Small Cities Community Development Block Grant Economic Set-Aside, the Massachusetts Land Bank, the Federal Trade Adjustment Assistance Program, Urban Development Action Grants and the Small Business Administration's 503 Program.

## FINDINGS

This report considers the record of these institutions over the past few years with the goal of drawing conclusions about their ability (in conjunction with private sector financial institutions) to answer the needs of Massachusetts firms in traditional industries. Based on information from questionnaires, interviews with agency directors and others active in commercial lending to Massachusetts manufacturers, and a review of relevant literature, the report suggests certain ways in which state action might help increase the stability and growth of traditional manufacturing in the Commonwealth.

The Commission is impressed with what it found. Massachusetts firms have access to a wider array of public institutions than companies in most states. These institutions open up longer-term and more subordinated financing to smaller firms than is generally available through commercial lending institutions. Given the importance of small and mid-sized companies expanding in the state, the breadth of innovative financing for such firms is welcome. An estimated \$3 billion has passed through these institutions since 1978. Another finding of the Commission's work is that a firm's chance of getting financing from the private sector or the programs discussed in this report has much more to do with its size and its management's capabilities than with its age or industry classification.

The Commonwealth of Massachusetts, through the public, quasi-public and publicly chartered agencies and corporations described in this report, has taken an active role in providing financial assistance to manufacturing firms in the state. Exhibits 1 and 2 summarize and compare ten of the 13 major institutions described in the body of this report. Exhibit 3 groups the institutions in terms of the major reasons the private capital markets may not advance



financing (capital costs too high for the firms to bear, collateral coverage insufficient, size of the loan or firm too small and business risk too great).

Exhibit 4 shows the geographic breakout of the portfolios of each of the four major state programs based on the number of loans. It indicates that except for CDFC, which has focused on the Boston Metro Area, there is no regional targeting of lending behavior. The geographic distribution of loans closely follows the distribution of statewide employment.

The public sector programs vary significantly in size. They vary in most other dimensions as well, such as percentage of loans to manufacturing industries, percentage to firms in traditional industries, size of firms assisted, size of loans, types of financing and use of financing. As is emphasized in the body of the report, they also differ in accountability to the state and in the financial commitment of the state to the program.

Despite these variations, certain general trends are discernable and important to note. Except for the Community Development Finance Corporation (which takes on higher risk situations) and the Massachusetts Technology Development Corporation (which helps with start-up financing for high technology firms), these agencies and programs are geared primarily to firms which are already fairly stable. Most of the programs specialize in expansion loans, usually for longer terms than banks are willing to provide and often in a more subordinated position or at below market interest rates. While several of the programs are targeted to depressed or deteriorating communities, even these are targeted to relatively low-risk firms willing to locate or expand in those communities.

These programs increase assistance to firms located in Massachusetts, without significant expense on the part of Massachusetts taxpayers. MIFA's Industrial Revenue Bond Program qualifies firms for federal tax exempt bonds, with no cost to the state. The Urban Development Action Grants, Trade Adjustment Assistance, Small Cities Set-Aside and SBA 503 programs are all federally funded. Massachusetts Capital Resource Company, although capitalized by the Massachusetts insurance industry, is indirectly financed by the state through a tax reduction for the insurance industry. The only other significant state resources used have been to CDFC (\$10 million), MIFA (\$10 million for loan guarantees) and MTDC (\$2 million).

It should be noted, however, that the state makes a significant investment in business expansions indirectly through various tax credit programs not discussed here. Roughly \$50 million a year in "tax expenditures" accrue to



Massachusetts companies, primarily through the state's Investment Tax Credit. Such credits, like most of the quasi-public institutions, benefit profitable firms which are expanding or upgrading their plant and equipment. Unlike the quasi-public institutions which select their own portfolios, tax expenditures are an "entitlement" program which can be used by every company making a qualified investment.

### Special Needs Of Mature Industries

The Governor's Commission on the Future of Mature Industries has identified three areas of special capital needs among firms in traditional industries in Massachusetts. These are:

- affordable expansion financing for plant and equipment
- capital for ownership changes or high risk corporate turnarounds; and
- financing for the development of new product and process technologies.

From the evidence gathered for this report, it appears that between the private and public sectors, expansion financing is available for most credit-worthy firms. The breadth and variety of existing financing mechanisms is encouraging. However, more aggressive marketing of the MIFA Industrial Mortgage Insurance Program would greatly enhance the ability of higher risk traditional companies to locate affordable fixed asset funding.

In the other two areas, there is still progress to be made. Leveraged buyouts by management or employee groups have become a popular way for people with a direct stake in a conglomerate or family-owned firm to keep the company alive and make it grow when a change of ownership threatens its continuance. In the past few years, the Massachusetts Capital Resource Company and the Massachusetts Business Development Corporation have participated in a number of leveraged buyouts, helping management in older companies finance the purchase of their firms from owners, usually either a large conglomerate or a small family-run concern. But as the charts indicate, the participation in leveraged buyouts of the institutions as described in this report is quite limited.

An additional area of need is assistance for companies struggling to remain viable. Often, when a plant is threatened with closing, the social costs to the state (measured in terms of lost tax revenues and increased social welfare costs) is greater than the cost of helping the firm restructure. Most of the quasi-publics are not willing or



legally able to take on the level of risk associated with such turnaround situations. Only CDFC has the capability and orientation to make these kinds of investments. However, it is limited to investing in communities with community development corporations.

A final area of financing need identified by the Commission as important for the future of Massachusetts firms in traditional industries is that of financing for the development of innovative product and process technologies. Investigations of plant closings in the state have uncovered examples of shutdowns where a lack of investment in new products was cited as a cause. This underinvestment is largely due to the perceived risk of new product development in industries which do not have a history of such innovation.

None of the programs described in this report can meet this special need. The Massachusetts Technology Development Corporation could potentially make investments in product development, however, it is limited to investment in "technology-related" companies and its Board of Directors reflects this orientation. Specific programs designed to promote new product investment and reduce its risk is an area where increased public sector assistance could help revitalize some traditional companies.

This review of public sector financing programs points to additional issues of concern to public policymakers. First, although there is a good deal of cooperation among the various state quasi-public agencies, with many examples of jointly funded projects, there is no formal coordination or clearinghouse of information on projects. The idea of a Massachusetts Industrial Development Authority to oversee and coordinate the various programs, proposed by the Governor's Task Force on Capital Formation for Economic Development in 1977, was never enacted. More policy research on the need for such an oversight agency may be called for.

Second, many businesses in the state still do not know about the availability of many of these financing programs. Although there have been some attempts to market these programs, they have not yet been effective. It is important that the state educate the financial, legal and accounting communities, as well as the companies themselves, to the existence of these programs.

Finally, the programs described in this report have all been chartered with specific public purposes, many related to state goals for job retention, economic development and revitalization of distressed communities. There has been no systematic assessment of the public returns from these uses of public resources. The state does not really know if its goals are being met. Although beyond the mandate of this Commission, evaluating these public returns is a

critical step to any further program design for publicly chartered or funded programs.

#### ORGANIZATION OF THIS REPORT

The following pages present the most significant public and quasi-public financing programs for firms in traditional industries unable to meet their financing needs through conventional private sector institutions. Included are state, federal and locally controlled programs. The array of options available to Massachusetts firms is impressive, far more so than in most states. It is to the credit of state policymakers that the Commonwealth continues to broaden its commitment to keeping established manufacturing firms in the state and to evaluating its substantial progress to date, with an eye towards reducing whatever obstacles remain.



## STATE FINANCING INSTITUTIONS

The most important source of financing for a business, outside of the private financial markets, consists of the broad array of programs and institutions established by the Commonwealth of Massachusetts. What distinguishes these programs is that they were created and/or administered by the Commonwealth. In some cases, the source of funds is private (MCRC and MBDC), in others, federal (The Small Cities Set-Aside Program, MIFA and a portion of MTDC's funds). However, each of the following institutions were chartered by the state and all but MBDC have representatives of the Commonwealth on their boards:

- The Massachusetts Industrial Finance Agency (MIFA)
- The Massachusetts Capital Resource Company (MCRC)
- The Massachusetts Community Development Finance Corporation (MCDFC)
- The Massachusetts Business Development Corporation (MBDC)
- The Massachusetts Technology Development Corporation (MTDC)
- The Massachusetts Government Land Bank; and
- The Small Cities Set-Aside Program.

## MASSACHUSETTS INDUSTRIAL FINANCE AGENCY (MIFA)

### INTRODUCTION

MIFA is by far the most active state-created financing institution for manufacturing companies in Massachusetts. Established by the State Legislature in 1978, MIFA has approved more than \$1.4 billion in financing for local manufacturers in its first five years, out of a total \$2.5 billion for all its programs. By way of comparison, the second largest portfolio, that of the Massachusetts Capital Resource Company, was less than \$100 million during this same period.

MIFA was established to stimulate industrial expansion and commercial revitalization in the Commonwealth. The agency's powers include issuing bonds and making loans for the acquisition and construction of industrial, commercial, pollution control and solid waste facilities. The Agency also has the authority to insure a portion of loans for industrial and commercial projects.

MIFA was proposed in 1977 as a response to a need to increase the supply and lower the cost of industrial loans--particularly expansion loans--to small and medium-sized businesses throughout the state. Because of the lack of market recognition and size, public stock issues were usually out of the question for these firms. Commercial bank loans were not long-term enough. Insurance companies would not finance small loans. While Massachusetts localities could issue tax-exempt Industrial Revenue Bonds (IRBs), only 108 of 351 Massachusetts municipalities had created the required Industrial Development Finance Authorities. More importantly, only 18 of these had actually issued bonds. Given this situation, the Task Force on Capital Formation for Economic Development proposed the creation of MIFA to combine several programs to help small and medium-sized firms find expansion capital. Today, MIFA administers five programs:

- tax-exempt industrial loans
- loan guarantees
- pollution control financing
- assistance for Commercial Area Revitalization Districts (CARDS); and
- financing for mixed-use commercial projects.



## STRUCTURE AND SOURCE OF CAPITALIZATION

MIFA is an independent state agency incorporated as a "public instrumentality" by the Legislature. The agency is governed by a nine-member Board of Directors appointed by the Governor, including three statutory representatives of the executive branch of state government and six individuals with relevant experience in commercial and business lending.

MIFA raises capital for loans through the use of industrial revenue bonds (IRBs), the interest income of which is exempt from state and federal taxation. MIFA is authorized to issue IRBs and to review and approve IRBs issued by local Industrial Development Finance Authorities. These bonds do not constitute a debt or obligation of either MIFA or the Commonwealth. They are repaid from revenues generated by the firm borrowing the capital. Once approved and issued, the greatest majority of IRBs are purchased by commercial banks and other financial institutions interested in increasing their tax-exempt holdings. These institutions then make the approved loans at below conventional interest rates, since the interest income is tax exempt. The IRB program costs the state nothing. MIFA received a \$270,000 start-up allocation from state revenues and repaid it in full in June 1983.

## PROGRAMS

MIFA currently offers five programs designed to meet the financing needs primarily of the state's manufacturing, research and development, and distribution companies. In addition, it assists cities and towns in revitalizing their commercial centers.

### Tax Exempt Industrial Loans

This is MIFA's principal program. Over \$1.5 billion in bonds have been approved since 1978 for manufacturing, warehousing, distribution and research and development enterprises. They are in the form of subordinated or senior debt with maturities of over seven years. Loan proceeds can be used for the construction, acquisition or improvement of plant, land and equipment which will result in creating or retaining employment in the state.

### Loan Guarantees

The Industrial Mortgage Insurance Program is designed to increase the availability of capital to smaller firms experiencing difficulty borrowing in conventional credit markets. MIFA provides guarantees for a portion of the loan, generally from 10% to 40%, thereby reducing a conventional lender's risk and allowing the company to borrow additional



funds. MIFA charges an insurance premium for its Industrial Mortgage Insurance Program, which raises the total interest cost by less than 1/2 percentage point. Processing fees add about another 1/2 percentage point to the loan. This program has issued guarantees totaling \$9.7 million in loans for 56 projects through December, 1983. These commitments have in turn leveraged a total of \$64 million in private lending. About 60% of the firms assisted by this program were in traditional industries. In general, these firms are smaller in size and number of employees than the firms which make use of MIFA's IRB program. This program was capitalized with periodic appropriations from the State Legislature.

#### Pollution Control Financing

Tax-exempt financing is available for pollution control facilities, ranging from specialized equipment for a particular company to large solid waste resource recovery plants. Through June 1983, MIFA had approved financing of \$483 million for 15 of these projects.

#### Assistance For Commercial Area Revitalization Districts

MIFA offers tax-exempt financing and loan guarantees to assist commercial revitalization projects. Commercial buildings including offices, hotels and retail stores, are eligible for tax-exempt loans if located within a community's Commercial Area Revitalization District (CARD). These districts are identified in a local community revitalization plan and must conform to criteria developed by the Commonwealth to target resources to commercial areas in need of revitalization. The CARD program has been widely used in the last four years, with 202 projects in 60 communities approved for \$351 million in industrial revenue bonds.

#### Financing For Mixed Use Commercial Projects

The Legislature expanded MIFA's powers in 1980 to finance buildings with mixed commercial and residential use if located within a CARD area. The residential use must be for rental housing and the financing must be used substantially for acquiring and rehabilitating existing buildings, not new construction. In addition, the local governing body and MIFA's Board of Directors must determine that the building is blighted and in need of restoration assistance. Furthermore, federal law requires that 15% to 20% of the apartments in the building be reserved for low or moderate income persons.

#### EXPERIENCE TO DATE

Below is a brief summary of MIFA's financing activities from November 1978 through December 1983. MIFA has financed



1,424 projects with industrial revenue bonds for a bond total of \$2.5 billion and total project costs exceeding \$3.1 billion (Exhibit 5). The following describes MIFA's portfolio.

Type Of Firm

- Of the manufacturing firms assisted, 80% are in traditional industries, while 20% would be considered part of the high technology sector.
- Within traditional manufacturing, the major industrial sectors making use of MIFA assistance included:
  - Fabricated Metals: 93 companies, \$99 million
  - Machinery except Electrical: 83 companies, \$95 million
  - Primary Metal Industries: 28 companies, \$35 million
  - Paper and Allied Products: 50 companies, \$75 million
  - Printing and Publishing: 79 companies, \$76 million
  - Rubber and Plastic Products: 61 companies, \$65.5 million
  - Textile and Apparel: 54 companies, \$73 million
  - Chemicals and Allied Products: 44 companies, \$52 million
  - Leather and Leather Products: 21 companies, \$28 million
  - Miscellaneous Manufacturing: 39 companies, \$51 million
  - Seafood Processing: 21 companies, \$26 million
- Industrial companies assisted by MIFA are primarily smaller firms. Over half of the enterprises had annual sales of less than \$5 million at the time of financing and more than three out of four had sales of less than \$20 million. The median net income for firms

approved for financing in 1982 was \$180,000 and the median net worth was \$760,000. The median employment level was 63 full-time workers. Two-thirds of the firms had fewer than 100 employees.

- Age of Firms: A representative sample of firms receiving IRB financing in 1983 shows 31% were founded before 1950, 32% were founded between 1950 and 1970 and 37% were founded since 1970.
- Ownership: About 85% of the companies receiving MIFA assistance had headquarters in-state.

#### Type Of Financing

MIFA provides access to long-term, below-market rate, secured and unsecured financing for industrial firms in Massachusetts. MIFA will issue bonds to finance all or part of a plant and equipment expansion project and will take a senior or subordinated debt position.

- Size of loans: MIFA is restricted by law to a \$10 million maximum on its industrial and commercial projects. Median: around \$1 million. Range: \$200,000 to \$10 million (although a few have been smaller).
- Term of loan: All MIFA loans have a maturity longer than seven years. Average for real estate: 15 years; average for equipment: 10 years.
- Interest rate: because the IRBs financing the loan are federally tax-exempt, the effective interest rate is 65% to 90% of prime.

#### EXAMPLES OF INVESTMENTS

##### Hudson Machinery Corporation

An IRB was an important component of the leveraged buyout of the Hudson General Company. In 1983 Hudson General decided to sell their machinery division which is engaged in the manufacture and warehouse-distribution of industrial and shoe machinery, spare parts and industrial trimming machines. Several managers created a new entity to buy the operation. The IRB enabled a trust to purchase the land and building from the parent company, as well as new equipment. The new manager/owners will lease the facility from the trust. It is estimated that the buyout retained 107 jobs in Haverhill.



### Boston Digital Corporation

Boston Digital Corporation is a Massachusetts-based company engaged in the manufacture of computer numerically controlled (CNC) machine tools. In 1983 MIFA approved a \$3.4 million IRB to the company, which had outgrown its leased facility in Hopkinton. The company used the IRB proceeds to acquire a 15 acre site, construct a 79,200 square foot manufacturing facility and to purchase equipment. The company projected an additional 75 jobs as a result of this expansion.

### THE FUTURE

MIFA has developed an impressive record helping small and medium-sized firms in mature industries find affordable plant and equipment financing for expansion. However, federal tax law restrictions prevent the agency from providing for some important financing needs of mature industry firms, such as new product development financing or small working capital loans. MIFA may not be as significant a future source of financing for buyouts, given recent congressional efforts to prohibit IRB financing for the purchase of existing plant and equipment unless 15% of the purchase price of the building is dedicated to rehabilitation.

The current Congressional effort to curb abuses of the IRB program in some parts of the country and to reduce the federal revenue loss resulting from the bonds' tax-exempt status makes it difficult to predict the future of MIFA's programs. The federal tax exemptions for IRBs are due to expire at the end of 1986, although the Senate has recently approved legislation extending the program through 1990.

MIFA has begun to look for new financing mechanisms. The demand for tax-exempt holdings by commercial banks may be diminishing, due to changes in the tax laws. MIFA may, therefore, face increasing difficulty in placing its bonds with private sector purchasers.

To address the issue of banks having a reduced need for tax-exempt income, MIFA has developed recently the Guaranteed Loan Program. This program enables MIFA to tap the national public credit market to provide long-term, fixed-rate financing for smaller businesses in Massachusetts. In recent years, as commercial banks have turned to short-term liabilities, smaller firms have had to finance more and more of their long-term needs with the shorter maturities found in the floating-rate financing market. MIFA's new program addresses this problem, while expanding the market for MIFA's bonds to attract individual and institutional investors.

Under the terms of the program, MIFA will guarantee 100% of principal and interest on first mortgage loans for eligible projects. A number of small loans are combined into a single bond issue. Because MIFA has arranged for a major insurance company to reinsure 75% of MIFA's commitment to the project, MIFA plans to be able to sell the issues in the national bond market at a fixed interest rate, with maturities of up to 20 years for real estate projects.

The advantage for Massachusetts firms is fixed-rate, affordable financing with long-term maturities. For MIFA, the advantage is a strengthening of the market for its bonds. It must be stressed, however, that this new program is not directed at risky, struggling companies. Because of the underwriting standards of the private insurer, only firms with very sound credit worthiness will be eligible for financing under this program.

In general, MIFA's programs either reduce capital costs or provide credit access to smaller companies who cannot find sufficient local capital sources. Only the Industrial Mortgage Insurance Program helps companies with marginal credit ratings, by reducing the risk exposure of private lenders. This program, however, has not been extensively used, representing only \$9.7 million since its inception in 1978. Many observers believe this is because MIFA has not aggressively marketed the program, not because there is insufficient demand for it. It could be an extremely useful way for traditional industries to access conventional sources of capital.



## MASSACHUSETTS CAPITAL RESOURCE COMPANY

### INTRODUCTION

In December 1977, nine Massachusetts-based life insurance companies formed the Massachusetts Capital Resource Company (MCRC). The creation of this private partnership followed the passage of enabling legislation in the State Legislature. It mandated the establishment of MCRC in exchange for reduced state taxes on premium sales and investment income of Massachusetts-based life insurance companies.

MCRC provides long-term, unsecured debt and equity capital to local manufacturers experiencing difficulty raising affordable funds in the private capital markets. Not all local companies are eligible. MCRC's enabling legislation contains detailed guidelines concerning the size, type and term of investment that MCRC can make; job creation and/or retention requirements; and the size and types of eligible borrowers. (See "Program Experience" below.)

In its 1976-1977 review of Massachusetts publicly-sponsored development finance institutions, the Task Force on Capital Formation for Economic Development identified the Massachusetts-based ("domestic") life insurance industry as a major source of finance capital which was investing a disproportionately small share of its premiums in smaller enterprises. Because these insurance companies traditionally stayed away from investments under \$5 million, smaller and younger firms in need of expansion capital were excluded from their portfolios. State policymakers realized that if these insurance companies could be induced to invest some portion of their assets in Massachusetts' smaller, younger firms, a serious "capital gap" could be narrowed and the state could realize significant employment and revenue benefits.

### STRUCTURE AND SOURCE OF CAPITALIZATION

The opportunity to address this problem presented itself when the Massachusetts-based life insurance companies launched a campaign to reduce their state tax rates which, at five times the national average, were the highest in the country. The State Legislature agreed to reduce the industry's tax rate in exchange for capitalization of MCRC at \$100 million and an investment of over half the capitalization in various "qualified investments" by 1982.

MCRC is publicly chartered, but it is a privately-owned and operated partnership. Unlike MIFA, MCRC is not an independent state agency. State financial support of MCRC is

indirect, through the guid pro quo tax relief. There are no state funds invested directly in MCRC itself. The capitalization comes entirely from the nine life insurance companies which make up the partnership. However, because it was created by a legislative act, MCRC is bound by a state charter committing it to explicit goals of job creation and investment in small and medium-sized manufacturing firms. In addition, MCRC is required to hire an urban loan specialist with experience in high risk lending to businesses located in high unemployment areas. The state monitors MCRC's performance in four ways:

- the Governor appoints one public member to the Investment Committee which sets overall policy for MCRC
- the State Insurance Commissioner certifies MCRC investments
- the Secretary of Economic Affairs certifies the number of jobs created by MCRC investments; and
- MCRC is required to file an annual report with the Legislature summarizing its activities.

MCRC is staffed by professionals with experience in bank lending and venture capital investment. Investments are approved by a six-member Investment Committee made up of officers of the contributing life insurance companies and a public member. These companies and their respective capital contributions, pro-rated on the assets of each company, are listed in Exhibit 6.

#### PROGRAMS

MCRC provides several different kinds of financing which can be helpful to traditional manufacturing firms. For example, MCRC can:

- make fixed-rate, long-term, secured loans to mature companies
- make subordinated loans to rapidly growing profitable companies;
- assist in management buyouts by providing subordinated debt; and
- provide young businesses which have outgrown their initial capital infusion with new equity or convertible debt financing.



Eligible businesses are defined in the legislation as firms with a Moody rating of BAA or below. Manufacturing operations are preferred, although commercial businesses are eligible. Debt is almost always unsecured and investments must have a maturity greater than five years. MCRC's total investment in a business must be smaller than \$5 million. There are other restrictions as well. MCRC cannot make a loan until the borrower shows that the loan could not be obtained elsewhere on "substantially similar terms." MCRC investments, on average, are supposed to directly create one new job for each \$30,000 invested. Certain businesses are specifically prohibited from receiving MCRC financing: real estate developers, financial institutions, contractors and utilities. In addition, MCRC must reserve at least \$3 million to invest in firms that meet the eligibility requirements for a small business investment company (SBIC) loan.

#### EXPERIENCE TO DATE

During its first five years of operation, MCRC was contacted by more than 1200 companies. Of these inquiries, about 30 percent were given serious consideration. Between January 1978 and December 1982, MCRC made 99 financings, totalling \$89 million, to 78 different companies. MCRC's level of activity since 1978 is shown in Exhibit 7. Ninety-six percent of the dollar amount of MCRC's investments went to manufacturing firms.

In response to a questionnaire prepared for this report, MCRC provided general information about its portfolio of 73 outstanding manufacturing investments as of December 1982. It is summarized below.

#### Type of Firm

Size: Almost half of MCRC's loans (48%) were to companies with sales below \$5 million, while 22% of the loans were to firms with sales greater than \$20 million. The remaining 30% fell in the middle.

Firms with fewer than 100 employees received 45% of the loans. Firms with between 100 and 250 employees received 25% of the loans and firms with more than 250 employees received 30% of MCRC Loans.

Industry: MCRC's manufacturing loans are distributed fairly evenly between firms in traditional industries and firms in high technology industries. Exhibit 8 breaks out the portfolio by industry.

Ownership: All but one of MCRC's 73 manufacturing loans were to independently owned companies. All loans were to firms headquartered in Massachusetts, as required by statute.

Borrowers' Financial Position: One-third of MCRC's loans were to firms with negative net income after taxes. Problem firms received 2/3 of the loans in 1978 and 1979 and only 1/3 of the loans made in 1980 through 1982. Of the 15 firms with negative net income financed in 1978 and 1979, seven were out of business by December 1982. Of the 10 such firms financed in 1980 - 1982, one was out of business by December 1982.

#### Type of Financing

Size of Loan: Over half of MCRC's loans were small, under \$500,000. Of the remaining 49%, 19% were loans between \$500,000 and \$1 million and 30% were greater than \$1 million. The average MCRC loan was for \$900,000 with a range stretching from \$125,000 at the low-end to the legally-mandated maximum of \$5 million.

Term of Loan: 78% of the loans had a maturity greater than seven years; 22% of the loans mature between three and seven years.

Interest Rates: MCRC charges current market interest rates for higher risk loans.

MCRC officials have characterized their five year investment experience as follows: approximately 15% of the investments have been "bail-out" financing of distressed companies; another 10% to 15% have been start-up, venture capital-like investments; approximately 10% have been to support management buyouts; and the remaining 60% to 65% of the loans have been to small and medium-sized businesses needing subordinated debt and/or equity financing to leverage long-term secured debt from commercial banks.

After early problems with their bail-out financings, including a number of business failures, MCRC has developed certain guidelines for financing distressed companies. MCRC will only finance bail-outs if existing management is sound or new management is brought in. MCRC will finance a new plant or a new product line. It will not refinance existing debt to pay out current lenders.

There has been some confusion about how risky MCRC's loans are supposed to be. MCRC is intended to make riskier loans than life insurance companies traditionally make. However, with the exception of selected "bail out" attempts, MCRC does not generally make loans to "marginal" firms. Although borrowers must show that they cannot get conventional financing at the price, terms and maturity



offered by MCRC, this does not mean that MCRC invests only in firms which have been unable to receive any financing from private sources. MCRC's loans are predominantly subordinated to senior bank financing.

#### EXAMPLE OF INVESTMENTS

##### Buxton, Inc., Agawam

Buxton was founded in Springfield, Massachusetts in 1898 by Mrs. Dana Buxton to provide novelties for the emerging bicycle industry. The business prospered and in 1907 the company's first plant was built, with leather goods added to the product line. Over the past 75 years the leather line has expanded to include key cases, men's and women's wallets, belts and passport cases. The Buxton name has attained strong consumer brand recognition and the company's products are now sold nationally through department stores, national chains, specialty stores, jewelry and gift shops. Buxton remained a family-owned company until it was sold to Gillette in April 1972 and, in turn, to Beatrice Foods in 1977. In 1982, with the help of a \$3 million senior debt loan from MCRC, the management team bought the company, returning it to local ownership.

#### THE FUTURE

MCRC now stands at an important crossroads. The company has completed its first five years of operations and has complied with its legislative mandate to invest at least \$60 million and create 2,000 jobs in eligible Massachusetts companies. Created as a limited partnership with a 25 year life, the enabling legislation restricted liquidation of the fund or significant dividend payouts to the general partners for 15 years. Thus, MCRC expects to continue as an active investment institution for the next ten years, investing from its currently available funds of approximately \$40 million (\$11 million principal capitalization and \$25 to \$30 million in loan repayments) and from its expected annual cash flow of \$20 to \$25 million. MCRC officials do not expect a radical departure from their current investment practices.

One problem facing MCRC today is what MCRC officials see as a narrowing of the "capital gap" the institution was established to fill. In the past three years the gap has been shrinking due to two separate developments. First, an increase in the availability of private venture capital has led to a wider range of investments in industries and financing situations previously considered unacceptable. At the same time, in an attempt to increase the yields on their portfolios, major institutional investors have been willing to take greater risks by investing in smaller companies and

in more equity-like financings. As a result, MCRC has had to reach out more aggressively to find investment opportunities and has had to market its services to a broader constituency. This shrinking "capital gap" is especially important in any evaluation of future state involvement in economic development financing. Public resources should not be allocated if they are not in fact needed to meet public goals and objectives.

MCRC officials feel there are still several areas where "capital gaps" exist. One is the lack of long-term, fixed-rate, unsecured financing for small and medium-sized businesses where MCRC remains virtually the sole source. Another, which is becoming increasingly important, is the lack of equity and subordinated debt for leveraged buyouts by management or community employee groups. Given the large amount of capital MCRC has to invest and given its job creation goals, MCRC is unlikely to become involved in too many micro loans. But MCRC has already financed a number of management buyouts and is well suited to continuing to provide subordinated debt, often with an equity kicker, in buyout packages.



## COMMUNITY DEVELOPMENT FINANCE CORPORATION (CDFC)

### INTRODUCTION

CDFC was established by the State Legislature in 1975 in response to the need of distressed communities, which had been losing manufacturing firms in traditional industries, to attract new jobs and new businesses. CDFC's mandate was to assist in the revitalization of depressed communities by providing venture capital to non-profit Community Development Corporations (CDCs) for a wide range of industrial, commercial, and housing development efforts.

Although CDFC financing is restricted to businesses sponsored by local CDCs, the investment is in the business itself, not in the CDC. Sponsorship by a CDC can mean sole ownership by the CDC, but more often sponsorship is limited to CDC provision of services to the firm. For a business to be eligible for CDFC financing, it must be located in an economically distressed area, have the potential to contribute to the economic development of that area, provide full-time, year-round jobs which pay at least 1.5 times the minimum wage, and provide adequate fringe benefits.

### STRUCTURE AND SOURCE OF CAPITALIZATION

CDFC is an independent state agency. It is not directly subject to the supervision of any state department and is exempt from the bureaucratic procedures (and salary scales) of state government. CDFC is publicly chartered, owned, and capitalized. The Commonwealth is the sole stockholder, having capitalized CDFC with the proceeds of a \$10 million general obligation bond issued to purchase all the agency's common stock. Investments and new policies must be approved by CDFC's nine-member Board of Directors. Three of these directors come from state government: the Secretaries of Economic Affairs, Administration and Finance, and Communities and Development. The remaining six directors (two with experience in finance, three CDC representatives, and one labor representative) are appointed by the Governor to staggered four-year terms. CDFC is run by a president and a small professional staff.

### PROGRAMS

#### Venture Capital Investment Program

CDFC's principal program benefiting small and medium-sized businesses is the Venture Capital Investment Program. Investments in this program are made through a three-way



partnership between CDFC, the participating CDC, and the private borrower. Investments typically include a combination of debt and equity with flexible terms, rates, and security. CDFC seeks to achieve maximum leverage from its funds. By taking a subordinate position in the financing package, CDFC enables the borrower to use available collateral to attract greater private commercial bank participation. In the past, most of CDFC's investments were made in very small manufacturing businesses, often with sales under \$1 million. In 1983 CDFC committed \$2.6 million to this program, leveraging an additional \$2.9 million in financing.

#### Small Loan Guarantee Program

A new CDFC investment program, begun on a pilot basis in 1982, is the Small Loan Guarantee Program. This program helps make credit more accessible to "micro" businesses in CDC areas by guaranteeing the lesser of 50% or \$25,000 of a loan made by a participating financial institution. The guarantee, usually in the form of a term deposit, is secured by available collateral and personal signatures. Initiated in conjunction with the Hilltown CDC in Western Massachusetts and now state-wide, the program has committed \$100,00 to eight firms.

#### Community Development Investment Program

Another new CDFC investment program, the Community Development Investment Program, was begun in 1982. It is designed to assist CDCs in the development and construction of affordable housing, as well as the development of industrial and commercial real estate. CDFC lends or invests up to \$250,000 for front-end financing of specific recoverable, development expenses. CDFC funds are used to leverage other public and private sources of funding. Through December 1983, \$1.4 million had been committed to 12 projects involving other financing of \$27.3 million.

#### EXPERIENCE TO DATE

CDFC has undergone a number of changes since its creation, partly in response to the changing capabilities of Community Development Corporations in Massachusetts and partly in response to lessons learned in its first few years. Between 1975 and 1978, while waiting for capitalization through a state bond issue, the agency focused on issues of organization and on helping the state's CDCs develop sufficient experience and expertise to utilize CDFC funds.

CDFC began making loans in 1979. Between 1979 and the end of 1982, CDFC committed \$5.1 million of its original \$10 million. Only \$2.1 million of the total was actually



advanced. Ten of the 20 businesses to which CDFC committed funds have failed, resulting in losses to CDFC of 26% of its committed funds and 47% of its advanced funds. However, because of high interest income on its uncommitted funds, CDFC still has \$5.5 million available for investment.

Since 1982, CDFC has made fundamental policy and program changes. Several new lending programs have been initiated, including a new focus on real estate development and on guarantees of private bank loans to very small businesses. CDFC is paying more attention to CDC management and providing more support work in this area. To this end, a companion technical assistance institution, the Community Economic Development Assistance Corporation (CEDAC) was created by the state in 1978. CDFC is also becoming more aggressive in making combination and equity financing rather than all debt investments. Some of these changes make CDFC a more promising source of financing for firms in traditional industries.

Below is a summary of CDFC's loans. Although CDFC continued to diversify into real estate and housing development loans in 1983, the agency has not changed its priority of financing direct job creation in manufacturing and non-manufacturing industries.

#### Type Of Firm

CDFC's manufacturing loans were primarily to small companies with little or no track record of success. The loans were risky and the rate of business failures among CDFC loan recipients has been high. This should be seen in light of the high risk nature of these firms.

Size Of Firm: Except for the Adams Printworks loan, all CDFC manufacturing loans were to firms with sales under \$2.5 million and fewer than 50 employees. Adams Printworks had between 100 and 250 employees at the time of the loan.

Industry: All but two of CDFC's manufacturing loans through 1982 went to firms in traditional industries.

Borrowers' Financial Position: Of nine existing manufacturing firms receiving CDFC financing through December 1982, seven had negative profitability at the time of the loan.

#### Type Of Financing

The structure of CDFC's manufacturing loans have varied greatly; some being senior debt, some subordinated (secured and unsecured), some equity, and many combinations. Loans have been relatively small and usually of a medium term of three to seven years.

Size Of Loan: Seventy-three percent of CDFC's manufacturing loans were smaller than \$250,000. Only one, Adams Printworks, was greater than \$500,000. CDFC has currently committed \$500,000 to the Boston Shipyard. Manufacturing loans have generally been larger than \$100,000, but CDFC has made loans for as little as \$20,000.

Term Of Loan: CDFC's loans are primarily used to help firms through the medium-term. Sixty-four percent of manufacturing loans were between three and seven years maturity. Only one loan had a maturity shorter than three years. The remaining 27% were of greater than seven years maturity. Real estate loans were in some cases for less than three years.

Type Of Loan

- equity: 43%
- senior debt: 22%
- combination debt and equity: 30%
- subordinated secured senior debt: 76%
- small loan guarantee: 19%

Use Of Proceeds

- expansion: 32%
- stabilization: 3%
- start up: 19%
- merger: 3%
- real estate development: 43%

THE FUTURE

CDFC has concentrated its lending activity in extremely difficult market situations, namely small manufacturing businesses in traditional industries, located in poorer urban neighborhoods. After a number of CDFC's earliest investments were liquidated, CDFC began to diversify its portfolio by serving CDC needs through commercial, industrial, and residential real estate lending. CDFC's president estimates that in the future, no more than half the agency's lending activity will be in small manufacturing businesses. Furthermore, within its Venture Capital Investment Program, CDFC will attempt to focus on companies with sales between \$1 and \$10 million and which have a management team in place and some previous acceptance in the market. CDFC will try to limit its investment to between \$100,000 and \$300,000 and to participate with other public and private lenders in all its financings.

It appears likely that CDFC's current programs will not be a major source of financing for older manufacturing



industries. CDFC's investable funds are currently \$5.5 million and as CDFC's initial efforts in real estate and housing development have proven successful, the requests by CDCs to use CDFC's funds to finance such projects have increased. However, CDFC does intend for its manufacturing loans to be oriented more towards traditional than high technology firms.

## MASSACHUSETTS BUSINESS DEVELOPMENT CORPORATION (MBDC)

### INTRODUCTION

Established by the Legislature in 1953, MBDC is the oldest of the five state-chartered agencies. The corporation, which is privately owned, managed, and capitalized, has a broad mandate to promote business development and growth in Massachusetts. With over 120 Massachusetts financial institutions pooling their money in MBDC, the corporation has tried to answer the medium and long-term financing needs of promising Massachusetts-based firms which, for various reasons, do not qualify for such loans from conventional lenders.

Several important characteristics distinguish MBDC from many conventional financing institutions:

- Loans are targeted toward smaller companies. MBDC's average outstanding loan in its portfolio is \$250,000.
- MBDC provides intermediate and long-term financing, usually between five and ten years, but in some cases up to 25 years.
- MBDC accepts collateral that is less readily negotiable than that usually taken by insurance companies or banks.
- MBDC generally does not require the long earnings record that conventional financial institutions do.
- MBDC normally supplements other financing, so that 100% financing can often be accomplished.

For smaller Massachusetts-based firms in traditional industries, MBDC has become an increasingly helpful source of financing. Since 1979, when new management took over at MBDC, the corporation has become a highly aggressive lender, somewhat of an anomaly among state-chartered Business Development Corporations across the country. In addition to its regular business lending program, MBDC activity has also been bolstered by its recent authorization by the United States Small Business Administration (SBA) to administer statewide the SBA's innovative 503 Program of long-term, fixed-rate financing for eligible small businesses. MBDC participates in this program through its new corporation, Massachusetts Certified Development Corporation (MCDC). (See section on SBA 503 Program, below.)



## STRUCTURE AND SOURCE OF CAPITALIZATION

MBDC is one of 23 state-chartered Business Development Corporations in the U.S., the first of which was established in Maine in 1949. Like other BDCs, MBDC is authorized by state legislation which mandates lending criteria based on state job development and economic development goals. And, like other BDCs, MBDC is privately-owned, managed, and capitalized. It is not a state agency and has no public representatives on its policymaking board.

MBDC has shareholders--corporations, public utilities, and individuals--which supply MBDC with equity and receive dividends. In addition, MBDC has a membership of over 111 Massachusetts banks and insurance companies. These member institutions provide funds to MBDC at reduced rates which the corporation then relends to private business borrowers. The Board of Directors is elected by the member institutions and the shareholders: two-thirds of the directors are elected by the members and one-third by the shareholders. Day-to-day operations are managed by professional staff.

The structure of MBDC provides several advantages over conventional lenders for serving smaller firms in traditional industries. By spreading the risk of its loan portfolio among its members, MBDC lowers the risk exposure of any one member institution. This allows MBDC to finance higher risk loans. MBDC also concentrates in one institution an experienced staff with expertise in higher risk lending. This creates a climate where higher-risk lending is a specialization, not just an after-thought, and creates economies of scale which can lower information and transaction costs.

## PROGRAMS

In its regular lending programs, MBDC concentrates on five types of loans:

- working capital, secured by fixed assets
- leveraged buyouts, when a significant loss of Massachusetts jobs are at stake
- secured mortgages, generally in a second position, with either conventional taxable financing or with an industrial revenue bond for plant expansion or new production facilities
- government-guaranteed loans, including SBA and Farmers Home Administration; and

- long-term loans for new equipment or energy conversion.

MBDC also makes SBA 503 program loans, which are discussed separately below.

#### EXPERIENCE TO DATE

In its 30 year history through 1983, MBDC made over 550 loans with a total financing of almost \$106 million, including bank participations. The outstanding portfolio of 65 loans (as of December 1983) is valued at \$17 million.

MBDC's annual lending volume has increased fairly steadily as the figures in Exhibit 9 indicate. MBDC's more aggressive strategy since 1979 is evident in its loan activity. From 1969 to 1979, average annual loan commitments ran close to \$3 million. Since 1979 they have been in the \$5 to \$6 million range. In 1983, the volume climbed to \$14 million through a combination of MBDC commitments and 503 Program loans.

The number of MBDC loans has also increased dramatically. Between 1976 and 1979, MBDC made an average of eight to ten loans per year. In 1980, loan commitments jumped to 23 and in 1981 to 25. In 1982, despite record high interest rates and sluggish business performance, MBDC still approved 15 loans totalling over \$4.5 million. In 1983, MBDC made 16 loan commitments and another 24 were made through the 503 Program by MBDC's related corporation, MCDC.

#### Type Of Firms Served

MBDC has proven to be an important source of financing for small and medium-sized firms in traditional industries in Massachusetts.

Size of Firms: Firms receiving loans range in size from \$1 million to more than \$20 million in sales. Roughly two-thirds of MBDC loans went to firms with sales below \$5 million and firms with fewer than 100 employees. The bulk of the remaining firms receiving financing had sales between \$5 and \$20 million (31%) and between 100 and 250 employees (28%).

Industry: Of MBDC's loans, 60% are to manufacturing firms, 20% to service and 20% to wholesale businesses. Seventy percent of manufacturing loans went to firms in traditional industries and 30% of loans went to high-technology firms. (This ratio seems to have narrowed in 1983).



Borrowers' Financial Position: Thirteen percent of MBDC loans went to firms with negative net income after taxes (all in 1980).

#### Type Of Financing

MBDC provided loans primarily for expansion, though the corporation participated in a significant number of leveraged buyouts. MBDC often provides the subordinated debt that enables sufficient capital to be raised.

Size Of Loan: Eighty-seven percent of MBDC loans have been under \$500,000. The average loan is approximately \$300,000. Loans are as small as \$100,000 and as large as \$600,000.

Loan Terms: Forty-six of 47 loans reported by MBDC were for longer than seven years.

Interest Rates: Generally three points over prime, floating, although it varies case by case.

#### Type Of Loan:

- 94% involved subordinated, secured debt
- 47% involved senior debt; and
- 43% involved a combination of the two.

#### Use Of Proceeds:

- 87% expansion and
- 13% leveraged buyouts.

#### EXAMPLE OF LOANS COMMITTED

##### State Line Snacks Corporation, Wilbraham

MBDC was approached in 1981 to help put together a financing package with Baybank/Valley which would enable a group of investors to buy the assets of the State Line Potato Chip Company from S.S. Pierce. MBDC approved long-term, secondary financing of \$200,000, permitting the acquisition to take place and assuring perpetuation of the business in Wilbraham. Prior to the acquisition, the business had experienced little or no growth for over three years. Now, under new ownership, the company has opened up new markets and has added a number of new products to its line of snack foods. Sales have increased by over 25 percent.

## THE FUTURE

In recent years, MBDC has substantially increased its lending activity and its standing in the Massachusetts financial community. In addition to its activity with the relatively new SBA Financing Program, MBDC has become more actively involved in real estate. For example, in 1982 MBDC worked out a \$3 million sale-leaseback arrangement with a biomedical firm, Delmed, Inc. in Canton. MBDC put in \$750,000 and arranged an IRB to finance the mortgage. As a result of this, the company was able to expand and create 250 new jobs. Although real estate deals will generally require a larger MBDC investment per firm, MBDC is likely to increase its efforts in this area.

Other priorities for greater lending activity in the future include commercial redevelopment, downtown revitalization, second mortgages, export financing, equipment leasing and fixed-rate lending (as opposed to the current portfolio of 100% floating rate loans). MBDC also sees an important role for increased lending in traditional manufacturing and service areas which are not attracting the same level and kinds of capital as high-technology industries.

One possibility which may increase MBDC's lending activity significantly in the coming years is the proposal by the Massachusetts thrift industry to establish a "pooled investment fund" in exchange for a phased reduction in state taxes on thrift industry assets (much as the domestic life insurance industry established the Massachusetts Capital Resource Company). This proposal calls for a fund to be capitalized at \$75 million over a three-year period and possibly to be managed by MBDC. The fund would make expansion financing available to Massachusetts-based businesses.

For Massachusetts firms in traditional industries, this new fund could be good news. Besides its more traditional lending, as leveraged buyouts become more common, MBDC could play a role in helping firms find subordinated debt for a buyout package.



## MASSACHUSETTS TECHNOLOGY DEVELOPMENT CORPORATION (MTDC)

### INTRODUCTION

MTDC is a publicly financed and managed venture capital firm charged with making investments in new technologically oriented companies. It was established in 1978 by the State Legislature to finance new technological ventures that, if successful over time, will strengthen the state's economy through promoting new jobs and mitigating fluctuations caused by the national economy. MTDC describes its mission as follows: "to provide capital to new and expanding technological enterprises which have the capacity to generate significant employment growth and other public benefits but which have been unable to secure from conventional sources sufficient affordable capital to fund such expansion adequately".

MTDC is not structured to be a financing source for older firms in traditional industries. The small businesses which MTDC finances must involve a "significant degree of technology". MTDC is legally capable of financing new product development for mature industries, but there would be considerable restrictions on MTDC's investments and on the mature companies it could finance. Half of MTDC's investments must be in economically distressed target areas, limiting the agency's ability to offer the program statewide. More important, the statute which created MTDC implies that MTDC must assist high-technology ventures. This has certainly been the experience to date. The board which authorizes MTDC investments might not allow the financing of firms in mature industries unless some clarifying statutory mandate were introduced for a mature industries new product program.

Despite the general inapplicability of MTDC as a source of financing for firms in traditional industries, MTDC is an important part of the Massachusetts array of quasi-public financing agencies. Because of this, and because the Boston-area economy has established a strong high-technology base during the last decade, a brief summary of MTDC activity is included here.

MTDC fills a capital gap for the high-technology sector. Venture capitalists are hesitant to invest in the kinds of start-ups which MTDC is mandated to finance. MTDC is willing to provide "patient" capital for the commercialization of products whose market potential, while strong, has not fully materialized. MTDC is also willing to accept a somewhat lower return on investment. The subordinated, deferred-principal features of MTDC's typical debt investments give companies the breathing space to bring their products to full



commercialization while demanding a return which, at long-term treasury rates, is substantially lower than rates on most investments of similar risk.

MTDC provides both debt and equity financing. All MTDC financing is provided as part of a joint venture with conventional private sector investors. MTDC typically takes a higher risk position, accepts a lower return, or is more willing to stay in longer than private venture capitalists. MTDC makes loans with a four or five year maturity at interest rates that fluctuate from one to three points below prime. MTDC investments range between \$100,000 and \$500,000 with a goal of leveraging three to four times that amount in private funds. As of April 1984, MTDC had committed over \$5.9 million to 31 firms throughout the state.

#### STRUCTURE AND SOURCE OF CAPITALIZATION

MTDC is an independent, not-for-profit, public corporation. It is governed by an 11-member board of directors composed of:

- three senior public officials: the Lieutenant Governor, the Secretary of Economic Affairs, and the Secretary of Administration and Finance;
- six private sector representatives, most of whom are associated with advanced technology companies; and
- two representatives of the university community.

The Corporation is managed and staffed by a professional team which is exempt from state civil service requirements.

MTDC has varied sources of funds including federal grants, state appropriations, interest earned on its bank funds, and revenues generated by its portfolio companies. The agency was capitalized originally in 1979 with a \$2 million grant from the United States Economic Development Administration. The grant was for the establishment of a revolving loan fund for technology-based businesses. In 1980, MTDC received an additional \$1 million from the United States Department of Commerce for the creation of a new capital fund for start-up companies, the Corporation for Innovation Development (CID) Fund. The Commonwealth matched the federal grant with a \$1 million appropriation and in 1982, contributed an additional \$750,000 to the CID fund. By law, state appropriations for operations are to be reimbursed, but not until such time as MTDC is "self-supporting".



## PROGRAM AND EXPERIENCE TO DATE

MTDC's investment strategy, which is designed to stretch its limited initial capitalization as far as possible, is to co-venture with private venture capital firms and to leverage long-term debt from commercial banks. MTDC performs a comprehensive financial, management, and market analysis of each proposal it seriously considers for investment (two or three of every 25 applications) and develops financial packages that it presents to private venture capitalists for participation.

Below are brief descriptions of the four programs offered by MTDC.

### Investment Activities

MTDC makes investments in companies at two different stages of development. It will provide capital to firms which have working prototypes, but little, if any, sales history. As of June 30, 1983, MTDC had invested \$325,000 in such situations. In addition, MTDC provides capital to companies with several years' sales history, of between \$700,000 and \$2 million in sales, and which seem ready for substantial growth. Investment funds are used for full scale commercialization of products. Approximately \$1.4 million in investments had been made by June 30, 1983, with an additional \$625,000 obligated. All investments involve both debt and equity.

### Financial Packaging Program

MTDC recently began this program to assist companies in raising private venture capital with no commitment of MTDC funds. MTDC assists entrepreneurs in packaging their proposals for presentation to venture capitalists and bankers. MTDC estimates that \$2.7 million was raised through this effort in 1982.

### Management Assistance Program

MTDC provides "financial counsel and advice on business plan preparation to companies not yet ready to apply for venture financing, as well as to entrepreneurs who are forming companies". MTDC estimates that 144 companies used this program during 1982.

## MASSACHUSETTS GOVERNMENT LAND BANK

### INTRODUCTION

The Massachusetts State Legislature created the Land Bank in 1975 to help communities hit hardest by the 1973 Department of Defense decision to close five military bases in Massachusetts (out of 40 closed nationwide). That federal action cost the state 6,400 civilian jobs, 7,400 military jobs and a payroll totaling \$1.5 billion annually. The creation of the Land Bank followed the recommendations of a state commission which determined that the massive scale, enormous initial investment, and long time periods required to redevelop these bases for civilian use required public financing assistance in order to attract desirable development and private investment.

The Land Bank proceeded to play an active role in the redevelopment of Westover Air Force Base, the South Boston Naval Annex, and the Chelsea Naval Hospital. As a result of its activity, the Land Bank holds long-term mortgages on two industrial parks in Boston and Chicopee, and a large housing development in Chelsea.

Seeing the Land Bank's success in developing and financing large projects, the State Legislature broadened the Land Bank's authority in 1980 to include blighted property as well as surplus state and federal property. This new mandate has enabled the Land Bank to expand its activities in management, construction, property development, and finance. The Land Bank is now moving ahead on projects involving the revitalization of industrial, residential, commercial, and mixed-use developments in communities across the state. The industrial project funding--open to cities, towns, non-profit organizations, and private enterprises--can, in some cases, help firms in traditional industries finance land acquisition, demolition, and site improvement at below market rates and flexible mortgage terms.

### STRUCTURE AND SOURCE OF CAPITALIZATION

The Land Bank is an independent state agency, currently capitalized by the sale of up to, but no more than, \$40 million of general obligation bonds. It is governed by a board of ten directors who represent both public and private real estate and development interests. Board members are appointed by the Governor to staggered three-year terms. The agency operates with a small staff of experienced project planners.



The staff and a subcommittee of the Board initially assess the feasibility and appropriateness of a project proposal. The full Board votes on preliminary approval after reviewing the staff's recommendation.

#### PROGRAM

The Land Bank is empowered to assist with three kinds of property: blighted open, decadent or substandard property, surplus state and federal property in Massachusetts. For each approved project, the Land Bank can undertake development activities including acquisition, rehabilitation, site preparation, construction, demolition, and disposition. Of the \$40 million capitalized, the available amount is currently committed. Generally, the Land Bank limits its investments to no more than \$3 million, though the range of its sixteen investments (as of June 30, 1983) is from a low of \$76,000 to a high of \$5.3 million. The Land Bank can either provide all the financing for a project or constitute only one component of a complex financing arrangement. Each project the Land Bank invests in must be economically viable and repaid in full.

The Land Bank is not simply a mortgage lender. Rather, the Land Bank takes an ownership interest in approved projects while the improvements funded by the agency are in progress. Once the site is improved and readied for development, the Land Bank resells the property on favorable terms to local project sponsors (public or private). When the Land Bank sells property, it can take back a mortgage at below market interest rates.

The criteria for Land Bank involvement in a project includes financial feasibility, public benefit, community support, and the leveraging of private investment. Public purpose considerations include the number and type of jobs created, short and long-term effects on local tax rates, and the impact on surrounding neighborhoods. Projects must show a need for public investment, including evidence of the inadequacy or unavailability of private funding sources and other types of public financing.

#### EXPERIENCE TO DATE

Of the Land Bank's 16 current investments, four are industrial developments, five commercial, and seven residential. The dollar investments are broken down as follows:

- industrial: 40%
- commercial: 24%; and
- residential: 36%.

The industrial projects, totaling \$8.3 million are: Boston Marine Industrial Park, Westover Industrial Park (which employs over 1,000 people), the Head of the Harbor State Fish Pier in Gloucester (fish processing modernization), and the Boston Shipyard Corporation (where former Bethlehem Steel employees continue ship building and repair work at one of the largest dry dock facilities in the Northeast).

#### EXAMPLES OF INVESTMENTS

##### Boston Shipyard, Boston

In 1982 Bethlehem Steel closed its East Boston Shipyard. A new corporation, Boston Shipyard Corporation, made up largely of former Bethlehem Steel employees, decided to purchase the shipyard and restore it to innovative use. The Land Bank committed \$1.5 million to the purchase of the property. That commitment helped Shawmut Bank decide to invest \$2.7 million and to share a first mortgage position with the Land Bank. Since re-opening in January 1983, the dry dock facilities have been awarded \$5.5 million worth of contracts. The company, which has one of the most versatile machine shops in Eastern Massachusetts, currently employs approximately 200 people.

#### FUTURE

In the future, the Land Bank is likely to become more involved in industrial and commercial projects than in recent years. The emphasis of the past two years on loans for housing projects is likely to be shifted. The Land Bank will be looking for job intensity as a major criteria for investment. The type of industry, high-technology or traditional, will be less relevant than the job creation potential of the proposed project, according to Land Bank staff.



## SMALL CITIES PROGRAM, ECONOMIC DEVELOPMENT SET-ASIDE

The Economic Development Set-Aside Program contains the only part of public financial resources in the state devoted exclusively to assisting economic development projects in communities under 50,000 in population. The Set-Aside was first established for fiscal year 1983 and funded with \$2.3 million of federal Small Cities Community Development Block Grant (CDBG) funds. Federal CDBG funds go directly to the larger entitlement cities. In the case of smaller cities, the federal monies are distributed to the state, which then gives grants to small city governments.

Projects acceptable for assistance must meet certain mandated standards and criteria. Specifically, Set-Aside projects must result in job retention/creation, leverage of private investment at a minimum private-to-public ratio of 2.5:1, and substantial benefit to low and moderate-income persons. Because the Set-Aside Program is intended to provide direct financing to qualified private for-profit entities, this program can be useful to firms in traditional industries located in communities with populations under 50,000 not already receiving CDBG "entitlement" funds.

Set-Aside funds are part of Massachusetts' Small Cities allocation of federal CDBG funds. The program is intended to fill gaps where other existing economic development resources, particularly Urban Development Action Grants and CDAG monies are either inappropriate or unavailable. The funds can be used to assist a broad range of economic development projects. The funded programs must meet at least one of the following national objectives and at least two of the following state objectives.

- National Objectives

- provide maximum flexible priority to activities benefiting low and moderate income families
- aid in preventing blight; and
- meet urgent community development needs where other financial resources are not available to address existing threats to a community's health and welfare.

- State Objectives

- support activities that benefit people with median household incomes below 80% of area income

- support activities which result in job creation/retention and/or commercial revitalization
- support neighborhood revitalization activities which improve housing and neighborhood stability
- support policies that provide for the existence of both subsidized housing and affordable private market housing; and
- support a community in meeting critical needs that would otherwise go unmet.

Because the Program is so new, it is difficult to analyze its success and still too early to develop a very clear picture of its financing priorities. But examples of eligible activities include:

- loan or grant to a firm for property improvements, construction of new facilities, and purchase of capital equipment
- loan or grant to develop a non-profit entity to rehabilitate blighted property for commercial or industrial use
- provision of job training programs in conjunction with major economic development projects; and
- assistance to a local economic development investment corporation or community development corporation for economic development projects cited above.

Activities which are not eligible are also specified, including:

- commercial revolving loan funds
- facade improvement
- new housing construction or housing rehabilitation
- downtown streetscape improvement
- speculative industrial or commercial projects which cannot provide firm evidence of projected tenancy; and



- projects involving relocation of a business or industry from one community to another.

Loans are available for a maximum amount of \$300,000 per funding round per community unless a waiver is obtained from the Secretary of Communities and Development for a larger award. There are three funding rounds each year. No community may submit more than one application for each round. Administered by the Executive Office of Communities and Development (EOCD), the terms and conditions of Set-Aside loans are negotiated between EOCD and the private developer in consultation with the responsible local official. The first round of loans were long-term (10 to 20 years) and at below market interest rates of 5% to 7%. Many observers describe the Economic Development Set-Aside Program as a minor UDAG Program (see following section), since it permits substantial public financial support directly for private development projects. One unique feature of the program is that all Set-Aside monies loaned to private projects may be recaptured by EOCD for use in later rounds of economic development financing.

#### EXAMPLE OF INVESTMENTS

##### Ware

The Town of Ware was awarded a \$290,000 grant which will be used to provide a long-term, low-interest loan to the Quabbin Wire and Cable Company. The loan will enable the firm to undertake an expansion and create 15 to 20 new jobs at its present location in Ware's Industrial Yard. The company will use the loan from the town for the purchase of new machinery and equipment. It will be used in conjunction with an IRB financed by the Bank of New England for the rehabilitation of the existing facility and for the acquisition and rehabilitation of an adjacent deteriorated mill structure.

## FEDERAL FINANCING PROGRAMS

The federal government operates a wide range of financing programs to support business development. For these programs, the financing decision is made by federal, as opposed to state or local officials. The following section presents a brief description of those financing programs of most relevance to companies in traditional industries. They include:

- The Urban Development Action Grant Program
- Trade Adjustment Assistance Program
- The Small Business Administration 7a and SBIC/MESBIC Programs; and
- Programs of the Economic Development Administration.



## URBAN DEVELOPMENT ACTION GRANTS (UDAG)

UDAG was created by the federal government in 1978 as a major economic development initiative. Administered by the Department of Housing and Urban Development, UDAG creates partnerships among government, private industry, and local communities in an effort to structure new and increased private investment in deteriorating local economies. Intended to complement the Community Development Block Grant Program, UDAG makes available substantial federal funds for a variety of public/private economic revitalization and neighborhood reclamation ventures. Eligible activities include infrastructure and public improvements; construction and rehabilitation of industrial, commercial, and residential property; and low-interest loans for expansion financing to private companies.

UDAGs are granted to cities and urban counties, but not all communities are eligible. Cities and counties must demonstrate a track record in offering equal opportunity housing for low and moderate income persons. They must also meet minimum criteria indicating physical and economic distress. These communities compete in quarterly funding rounds for approximately \$400 million each year. Successful grantees then distribute funds to private developers with whom they have formed a partnership for the purposes of the UDAG project. Loans are made at below interest rates (often 3% to 7%) and are usually long-term (10-20 years). No application is approved without a firm commitment of private resources.

UDAGs range from \$56,000 to \$6.7 million for small cities (under 50,000 people) and from \$75,000 to \$14.2 million for large cities. The average grant for small cities is \$852,000 and for large cities \$2.7 million.

### EXPERIENCE TO DATE

Massachusetts communities successfully competed for 88 UDAG awards totalling \$185.3 million between 1978 and March 31, 1983. In fiscal year 1983, Massachusetts firms were awarded 21 UDAG grants with a value of \$18.3 million. The Housing and Urban Development (HUD) Boston area office estimates that since 1978, over \$1.2 billion in additional financing has been leveraged by UDAG funds and that UDAG programs have created an estimated 9,500 construction jobs and 5,100 permanent jobs.

## EXAMPLES OF INVESTMENTS

### Methuen Industrial Development

A UDAG grant for \$820,000 coupled with a private commitment of \$4.3 million will enable the City of Methuen to provide a five percent loan to the Methuen Company for the construction of an 80,000 square foot building to be leased to eight manufacturing firms.

### Peabody Centennial Industrial Park II

A UDAG grant of \$2.9 million plus \$2.4 million in private financing will be used by two companies locating in the city-owned Centennial Industrial Park. Avnet Corporation, an electronic components distributor, will build a new 290,000 square foot facility and James W. Dailey Corporation, a pharmaceutical distributor, will build a 137,000 square foot facility.



## TRADE ADJUSTMENT ASSISTANCE (TAA) PROGRAM

The TAA Program is a federal effort to help firms, primarily manufacturers, adjust to business problems created by competition from imported products. Authorized by the Trade Act of 1974, there are two types of trade adjustment assistance for firms (exclusive of the trade adjustment assistance program for dislocated workers). They are:

- Technical Assistance for which the federal government pays up to 75% of the cost of helping businesses with marketing, engineering, financial management or other problems; and
- Financial Assistance for which the federal government provides loan guarantees or direct loans for new machinery and equipment, new or renovated buildings, or for working capital.

For a firm to be eligible for TAA financing assistance, the firm must demonstrate a decline in sales or production over the past 12 months compared to the previous year. The firm must also show actual or threatened unemployment of a significant portion of its workers. The International Trade Administration of the Commerce Department then evaluates whether increased imports contributed substantially to the firm's decline. If this appears to be the case, the firm is certified as eligible for, though not automatically entitled to, assistance under the TAA program.

### PROGRAM

Technical assistance is a major component of the TAA program. Once a firm has been certified by the U.S. Department of Commerce as eligible for assistance, Trade Adjustment Assistance Center (TAAC) professionals who include CPAs, engineers, and marketing specialists visit the firm to conduct a thorough analysis of every phase of the client's operations. They then work with the client to develop a recovery strategy. Once the strategy is approved by the U.S. Department of Commerce, the firm can receive help in the form of consulting services in such areas as improving plant layout, product development, marketing, information systems, and worker incentive plans. Services are provided by either TAAC staff or outside consultants hired by TAAC with the client firm's approval.

Eligible firms can also obtain two kinds of financial assistance: direct loans and loan guarantees.

Direct loans have an upper limit of \$1 million. Loans are typically used for acquisition of machinery and equipment, real estate, plant facility expansion, or for working capital. The interest rate changes quarterly, based on the Treasury Bill rate plus 1 3/4%. Direct loans in amounts of less than \$500,000 will not be granted unless the SBA has previously refused to grant the loan. That is, firms looking for a TAA loan under \$500,000 must first go to the SBA for financing. In general, the same criteria apply for Trade Act loans as apply to SBA loans:

- Trade Act loans must be fully collateralized by assets, including accounts receivable, inventory, real estate, and equipment.
- Personal guarantees are required from each stockholder with more than 20% of the company's equity.
- Life insurance (assigned to the government) for the full loan amount is required on each of the stockholders with over 20% of the company's stock.
- Generally, Trade Act loans cannot be used to pay out present lenders. The government will take second position on assets behind present lenders.
- There must be a well thought-out business plan which indicates adequate cash flow to repay the loan.
- The term of the loan is generally seven years or less, except for the purchase of real estate or machinery, in which case the term can extend to the life of the asset acquired, up to a maximum of 25 years.

In addition to direct loans, the federal government will guarantee up to 90% of the value of loans advanced by commercial lenders, with a maximum of a \$2.7 million guarantee (on a \$3 million loan). Lenders may charge up to 2.75% above prime rate on these loans. The Office of TAA will consider direct loan financing only if a guaranteed loan cannot be structured. Some mixing of guaranteed and direct loans is permitted with maximum assistance limited to \$4 million (\$1 million direct, \$3 million guaranteed).

TAA assistance is not useful as short-term, interim financing. It generally takes four to six months from submission of the loan package before monies are received. Moreover, the TAA program does not provide interim financing to carry a firm until the full package can be acted upon.



## EXPERIENCE TO DATE

There are 13 regional technical assistance centers across the country funded by the U.S. Department of Commerce to provide management consulting services and financial assistance to firms which have been adversely affected by import competition. Massachusetts firms consult with the New England Trade Adjustment Assistance Center located in Boston. The bulk of NETAAC's clients range between \$2 million and \$100 million in sales and employ anywhere from 20 to 2,000 workers. These firms manufacture a wide range of products: electronic components, telecommunications equipment, furniture, sporting goods, apparel, plastic products, and jewelry.

NETAAC is far more active providing technical assistance than financial assistance. In fiscal year 1982, the Center provided assistance of one form or another to 119 firms. But NETAAC submitted only two loan applications, one of which, a \$3 million loan guarantee to a Rhode Island jewelry manufacturing firm, was approved in fiscal year 1983. This pattern changed somewhat in 1983, with several new loan applications submitted and approved. Since 1978 13 firms in Massachusetts have received \$15.8 million in TAA direct loans and loan guarantees. Most of these firms were in the apparel and knitting industries, and a few in shoe and leather. Recently, machine tool and fabricated metal firms have been among the loan recipients.

## EXAMPLE OF INVESTMENTS

### Abbott Machine Company, Wilton, New Hampshire

Abbott Machine Company is a manufacturer of yarn winding machines. Founded in 1930, Abbott introduced the first automatic knitting machines to the textile industry and supplied machines and parts to major textile manufacturers. As European manufacturers began to penetrate the U.S. market with more automated winders in the 1960s, Abbott lost market share, reduced its workforce, and began to decline. A new owner in 1979 developed a new simplified highspeed winding machine and pinned the company's future on the new technology. The owner turned to the New England Trade Adjustment Assistance Center for help in development, finance, and marketing. NETAAC hired a consulting firm to help Abbott with the engineering and testing. In addition to \$233,000 in technical assistance, Abbott's owners obtained a \$1 million direct loan through NETAAC to finance the development of the machine, prototypes of which have been assembled, tested and demonstrated.

## SMALL BUSINESS ADMINISTRATION (SBA)\*

In addition to the Certified Development Corporation program, the federal SBA administers various programs which provide loans and management assistance to small businesses. Some of the agency's most important programs include the following:

### SMALL BUSINESS LOAN GUARANTEE PROGRAM (SECTION 7a)

Small manufacturers, wholesalers, service enterprises, farmers, and other businesses can receive an SBA guarantee for up to 90% (\$500 thousand maximum) of a loan made by a private lender. Under some circumstances, a direct loan of up to \$150 thousand can be arranged. Eligible businesses are independently owned and operated, not dominant in their field of business, and fall within SBA size guidelines (which vary according to type of business activity).

### SMALL BUSINESS INVESTMENT COMPANIES (SBICs) AND MINORITY ENTERPRISE SMALL BUSINESS INVESTMENT COMPANIES (MESBICs)

SBICs and MESBICs are capital corporations formed to encourage private sector investment in small businesses. MESBICs focus on financing minority-owned firms. Equity funds, long-term loans, and management assistance are provided for start-ups, expansions, or acquisitions, particularly to innovative ventures developing new products or markets. MESBICs and SBICs must be chartered as corporations or as limited partnerships with a corporate general partner. Both must have adequate capital to provide reasonable assurance that they can operate actively and profitably.

\* Exerpted from Massachusetts Department of Commerce and Development: Massachusetts Financial Resources Directory



## ECONOMIC DEVELOPMENT ADMINISTRATION (EDA) \*

The EDA has a wide variety of programs aimed at encouraging economic development including public works programs, business loans, and economic planning grants. Three of the major programs and their current regulations are described below.

### TITLE I PUBLIC WORKS AND DEVELOPMENT FACILITIES

States, municipalities, special authorities, and public or private non-profit organizations are eligible to apply for grants for the acquisition, development, or expansion of public works facilities. Included are: water and sewer systems, site improvements for industrial parks, factories, and port facilities. These funds cannot be used for the acquisition of land. Grants are for 50% to 80% of project cost, depending on location. In order to apply for grants, an area must have an approved Overall Economic Development Program (OEDP) on file with EDA.

### TITLE II BUSINESS DEVELOPMENT LOANS

Any public or private entity including non-profit corporations, sole proprietorships, and partnerships are eligible to apply for direct loans, to be used for the acquisition of fixed assets (land, buildings, equipment, machinery); land preparation; building rehabilitation; and working capital for industrial or commercial enterprises. Loans are available for up to 65% of project cost with up to 25 years to repay for fixed asset loans, and five years for working capital loans. Interest rates are based on the current U.S. Treasury borrowing rates. EDA also guarantees up to 90% of the unpaid balance of loans and up to 90% of rental payments on guaranteed leases. Interest rates on guaranteed loans are at prevailing market rates. All loans must be consistent with the area's OEDP and must be approved by a state or local economic development agency. In Massachusetts, this function is normally performed by the Governor's Office of Economic Development.

### SUPPLEMENTAL AND BASIC GRANTS PROGRAM (SECTION 304)

The 304 program provides states (which must supply a 25% match) with monies to initiate and enhance eligible economic development projects. Eligible projects include: grants and loans for public works and development facilities; business and industrial loans and loan guarantees; grants for technical assistance, research, and economic development

planning; and grants for special economic development and adjustment assistance. Projects must conform to the state's economic development goals and policies.

In general, the following are eligible to apply for the various EDA programs: the authorities and quasi-public corporations created by the state or by municipalities; non-profit organizations representing any redevelopment area or part thereof; and private profit-making entities.

\* Exerpted from Massachusetts Department of Commerce and Development: Massachusetts Financial Resources Directory



## LOCAL FINANCING PROGRAMS

Throughout Massachusetts, local organizations have been actively involved in financing programs for community economic development efforts. Working primarily with a variety of federal resources, these groups have become an important source of financing for traditional industries. This section briefly reviews:

- Local SBA Certified Development Companies
- Local Revolving Loan Funds.

SMALL BUSINESS ADMINISTRATION 503 PROGRAM:  
LOCAL CERTIFIED DEVELOPMENT COMPANIES

The SBA's 503 Program is a federally funded program which provides long-term, fixed-rate, financing to small businesses through SBA-certified, locally created, certified development companies (CDCs). The program provides low cost second mortgage financing for small for-profit business concerns, i.e., those with total net worth below \$6 million and average net profits for the last two years, after taxes, of less than \$2 million a year. Loan proceeds can be applied to fixed assets including:

- the purchase of land and/or buildings
- machinery and equipment
- construction and expansion
- renovations/leasehold improvements and modernization; and
- related legal, architectural and other costs.

The 503 loan is always only a part of a financing package and never more than 50% of the total. A participating bank of the borrower's choice usually provides 50% of the financing at bank terms and rates. The SBA-certified CDC sells a debenture (usually at two or three points below prime) which is guaranteed 100% by the SBA. The proceeds of the debenture are used to finance an equity injection as part of the deal. The 503 loan portion of the financing cannot exceed \$500,000. Loans are long-term: 15, 20 or 25 years at a fixed interest rate.

Not all types of businesses which meet the size criteria are eligible for the program. Ineligible businesses include non-profit organizations, print media, lending institutions, gambling facilities, recreation facilities that are not open to the public, and real estate investment firms. In addition, the loans are subject to certain conditions: they cannot be used for working capital, the project cannot be funded by any money derived from tax-exempt sources such as industrial revenue bonds, and at least 50% of the project funding must be from non-federal sources.

EXPERIENCE TO DATE

Manufacturing firms have obtained 26% of total 503 loans across the country. Thirty-six percent of 503 loans have



been to wholesale and retail firms and 25% to service businesses.

In New England, 39% of the loans made by certified development companies in the third quarter of fiscal year 1983 went to manufacturing firms. There are many advantages of a 503 loan for the borrower: long-term financing, low downpayment (usually 10%), low closing costs, and low interest rates. These loans compare favorably with IRB financing and generally give longer terms.

The 503 loan is made by a CDC organized under the provisions of Section 503 of the Small Business Act. These CDCs must be certified by the SBA. In addition, each loan made from an SBA-guaranteed debenture and sold by a CDC must be approved by the SBA.

Massachusetts has been a very active state in the 503 program, third only to California and Ohio in the amounts allocated to date. There are 18 different CDCs in existence in Massachusetts, most of which are restricted to activity in particular counties or cities. Exhibit 6 lists these CDCs. The only statewide CDC is the Massachusetts Capital Development Corporation (MCDC) which was created by the MBDC in 1982. Together, these Massachusetts CDCs have made 96 loans since the program began in 1981, providing the Commonwealth's small businesses with \$19.4 million in low cost financing (average loan \$202,000) in its first year. MCDC made 18 of these loans for a total of \$6.9 million (average loan: \$350,000).

## LOCAL REVOLVING LOAN FUNDS

Massachusetts cities meeting federal size standards receive U.S. Department of Housing and Urban Development CDBG funds directly. They are not part of the previously described State Small Cities Program. These "entitlement cities" have populations of over 50,000 or are central cities in the state's Standard Metropolitan Statistical Areas (SMSAs) with similar populations.

Many of the cities have used part of their CDBG funds to capitalize revolving loan funds. In some cases, EDA monies are also used to create these programs. Although the Commission did not survey all of these programs, the following provides a sample of these programs:

- In 1983, Boston allocated \$2.3 million of its \$23 million in CDBG funds for its revolving loan program. Loans have 15 year maturities with rates 2% below the discount rate. Thirty projects have been financed through this fund.
- Fall River has a \$1 million revolving loan fund that provides industrial and commercial loans at 7 1/2% interest with five-year maturities. It has financed 38 projects.
- Lynn's revolving loan program has been capitalized at \$1.3 million. It has made 50 commercial and industrial loans at 8% rates and maturities of 15 years.
- Quincy has a \$500,000 fund which has made 35 commercial and industrial loans at 5% rates with five year maturities.
- Worcester's \$1 million revolving loan program has provided 30 commercial and industrial loans, with 15 year maturities and rates tied to prime.

Many of these loans were to companies in traditional industries. In the case of Boston, all the loans went to companies in mature industries: in Lynn 62%; Worcester 40%; Fall River 30%; and in Quincy, 5%.



## CONCLUSIONS

This report has summarized the existing public financing resources available to businesses in the Commonwealth. The Commission was not able to systematically review the financing needs of the business community not currently being met by the private or public sector. Discussions with many knowledgeable people, however, suggest that businesses in traditional manufacturing have a continuing need for financial assistance in the following areas:

- expansion financing for plant and equipment at affordable interest rates;
- microbusiness financing;
- leveraged buyouts;
- high risk corporate turnarounds; and
- new product and process development.

Access to expansion financing for plant and equipment will be improved through two new MIFA programs: the Mortgage Insurance Program and the Guaranteed Loan Program. The Commission supports these two programs as potentially useful sources of debt for companies in traditional industries.

Microbusiness financing is being provided by CDFC's new Small Loan Guarantee Program. Accessibility of small companies to small loans is not, in itself, a mature industries issue, yet it is expected that some of the Commonwealth's smaller and older manufacturing firms will benefit from this program.

Leveraged buyouts occur predominantly in older firms as a way of financing a change of ownership. While MCRC and MBDC already participate in such buyouts, the Commission hopes these organizations will become even more active and promote their willingness to participate in such financing situations. Leveraged buyouts often are the means for maintaining viable businesses and jobs in the Commonwealth.

High risk corporate turnarounds are a minor part of public and quasi-public lending activities. To a large extent, this is appropriate. However, the Commission found that there is a need for flexible, quickly available funds for situations in which a turnaround is possible. None of the institutions discussed in this report sufficiently address this need. As a result, the Commission recommends the establishment of a Stabilization Fund for short-term

financing in turnaround situations which affect the possibility of maintaining employment in the Commonwealth.

New product and process development activity is key for companies in mature industries fighting to remain competitive. None of the public or quasi-public programs discussed in this report are structured in a way which encourages this activity. As a result, the Commission recommends the creation of a Product Development Fund to finance new product development and market introduction so that employment opportunities in the state are enhanced.



# EXHIBIT 1

## Summary of Financing: Financing Characteristics

PROGRAM	PURPOSE	TOTAL RESOURCES	ACTIVITY TO DATE	TYPE OF FINANCING	USE OF FINANCING
CDFC	To aid in revitalizing depressed communities.	\$10 million	\$9.9 million	senior debt equity subordinated debt combinations	32% expansion 6% stabilization/ merger 19% start-up 43% real estate
MTFA	To make long-term, tax-exempt financing available on a state-wide basis.	not limited	\$2.5 billion	senior debt & subordinated debt through tax-exempt IRBs loan guarantees	fixed assets
MCRG	To provide intermediate and long-term, subordinated debt and equity to smaller firms.	\$100 million	\$89 million	30% senior debt 25% subordinated debt 36% subordinated debt with equity 9% equity	65% expansion 10% buyout 15% stabilization 10% start-up
MBDC	To provide intermediate and long-term debt to smaller companies in conventional loans are not available.	not limited	\$104 million	intermediate secured debt long-term secured debt subordinated debt	87% expansion 13% buyout
SBA 503	To provide long-term financing of fixed assets for small businesses.	not limited	\$19.4 million in Massachusetts	SBA guaranteed subordinated debt (40% of total loan package)	fixed assets only
MTDC	To increase supply of venture capital to technology-based enterprises.	\$6.0 million	\$5.9 million	equity and debt together	start-up, and expansion
LAND BANK	To help redevelop surplus state and federal government property and blighted property.	\$40 million	>\$20 million	real estate mortgages	real estate development site preparation acquisition
SMALL CITY SET ASIDE	To assist economic development in smaller cities.	\$2.3 million	\$1.1 million	loans from municipalities which receive grants from the state	expansion plant & equipment job training
UDAG	To stimulate economic development in deteriorating communities.	\$400 million per year nationwide	\$185.3 million in Massachusetts since 1978	loans from municipalities which receive grants from HUD	broad range of activities
TAA	To help companies respond to foreign competition.	fiscal year 1983 nationwide \$5 million direct loans & \$12 million guaranteed loans	\$15.8 million in Massachusetts since 1978 in direct & guaranteed loans	direct loans guarantees	expansion working capital machinery & equipment

# EXHIBIT 1 (continued)

PROGRAM	SIZE OF LOAN	TERM OF LOAN	INTEREST RATE
CDFC	73% - 4\$250,000 18% - \$250,000 - \$500,000	one loan 43 years 64% 3 - 7 years 27% 17 years	12% - 15% for manufacturing loans
MIFA	median: around \$1 million range: \$200,000 - \$10 million	17 years 10 years for equipment 15 years for real estate	65% - 90% of prime
MCRC	Average: \$900,000 Range: \$125,000 - \$5 million 51% under \$500,000	78% 17 years 22% 3 - 7 years	market rate
MBDC	Average: \$300,000 Range: \$100,000 - \$600,000	5 - 25 years	generally 3 points above prime
SBA 503	Average: \$202,000 Range: \$88,000 - \$500,000	15 - 25 years	debenture at 2 - 3 points below prime
MTDC	Range: \$100,000 - \$500,000	Average: 4 - 5 years	prime plus 1 - 3 points
LAND BANK	Range: \$76,000 - \$5.3 million	long-term	below market rate
SMALL CITY SET ASIDE	maximum \$300,000 funding	long-term	below market rate often 5% - 7%
UDAG	Small Cities: \$56,000 - \$6.7 million Large Cities: \$75,000 - \$14.2 million	long-term: 10 - 20 years typical	3% - 7%; negotiated with HUD
TAA	loans: maximum \$1 million Guarantees: maximum \$3 million	generally 7 years or less	Treasury bill rate plus 1.75%



## EXHIBIT 2

### Summary of Financing Programs: Borrower Characteristics

PROGRAM	ACTIVITY TO DATE	PERCENT BY SECTOR	PERCENT BY TYPE OF MANUFACTURING	SIZE OF FIRM (ANNUAL SALES)	NUMBER OF EMPLOYEES	PERCENT OF FIRMS WITH POSITIVE PROFITABILITY
CDFC through December 1983	\$9.9 million	60% manufacturing 13% real estate 20% commercial services etc.	75% - 85% traditional 20% high technology	all but one had sales less than \$2.5 million	all but one had fewer than 50 employees	22%
MIFA through March 1983	\$2.5 billion	73% manufacturing 12% commercial & other 15% warehouse	80% traditional 20% high technology	median: \$5.3 million	median: 63 66% - less than 100 employees	98%
MCRC through December 1982	\$89 million	96% manufacturing	50% traditional 50% high technology	48% - less than \$5 million 30% - \$5 - \$20 million 22% - more than \$20 million	45% - less than 100 employees 25% - 100 - 250 employees 30% - more than 250 employees	67%
MBDC to December 1983	\$104 million	75% manufacturing	70% traditional 30% high technology	66% - less than \$5 million 31% - \$5 - \$20 million 3% - more than \$20 million minimum - \$1 million	64% - less than 100 employees 28% - 100 - 250 employees 8% - more than 250 employees	87%
SBA 503 through December 1983	\$14.4 million in Massachusetts	26% manufacturing 25% service 36% retail & wholesale	traditional & high technology (exact mix N/A)	net worth must be less than \$6 million	N/A	N/A
MTDC to July 1983	\$5.9 million	100% manufacturing	100% high technology	start-up - less than \$2 million	N/A	N/A
LAND BANK to June 1983	greater than \$20 million	40% industrial 24% commercial 38% residential	mostly traditional	N/A	N/A	N/A
SMALL CITY SET-ASIDE to January 1984	\$1.1 million	2 of 3 in first round in manufacturing	1 wire & cable co. 1 wood stain co.	N/A	N/A	N/A
UDAG through March 1983	\$185.3 million in Massachusetts since 1978	housing; down- town development; manufacturing; in urban areas	N/A	N/A	N/A	N/A
TAA	\$15.8 million in Massachusetts since 1978 direct & guaranteed loans	100% manufacturing	100% traditional (apparel, shoes & metals)	N/A	N/A	N/A

**EXHIBIT 3**  
**Problems Addressed by Public Financing Institutions**

<u>CAPITAL COST</u> <u>TOO HIGH</u>	<u>COLLATERAL</u> <u>COVERAGE POOR</u>	<u>SIZE OF FIRM/</u> <u>LOAN TOO SMALL</u>	<u>BUSINESS RISK TOO GREAT</u>
EDA	MBDC	MBDC	CDFC (depressed community)
MIFA	MCRC	SBA	Government Land Bank (redevelopment of facilities & property)
REVOLVING LOAN FUNDS			MIFA Guarantee Fund
SMALL CITIES SET-ASIDE			TAA (imports)
UDAG			TDC (new technology)



# **EXHIBIT 4** **Geographic Distribution of Massachusetts Financing Institutions' Portfolios**

	GEOGRAPHIC DISTRIBUTION OF PORTFOLIOS BY AGENCY (%)					TOTAL FOR FOUR AGENCIES
	REGIONAL EMPLOYMENT AS A PERCENT OF STATEWIDE NON -GOVERNMENT EMPLOYMENT	MIFA	CDFC	MBDC	MCRC	
Boston Urban Metro	20%	8%	41%	13%	7%	9%
Boston Suburban Metro	35%	35%		34%	47%	35%
Fall River/New Bedford	7%	12%		4%	8%	8%
North Shore	10%	10%	6%	13%	16%	13%
Springfield, Chicopee & Holyoke	7%	8%		9%	9%	10%
Berkshire County	2%	5%	12%		1%	3%
Brockton	4%	5%	6%	13%	1%	6%
Worcester County	10%	13%	18%	4%	7%	11%
Rest of State	5%	4%	18%	11%	4%	5%
	100%	100%	100%	100%	100%	100%

Totals may not sum due to rounding.

**EXHIBIT 5**  
**MIFA Financing Activities January 1979 - March 1983**

<u>CATEGORY</u>	<u>#</u>	<u>PROJECTS</u>	<u>%</u>	<u>DOLLARS</u>	<u>APPROVED</u>	<u>%</u>
Manufacturing Companies (plant & equipment)	780		67.0%	\$914 million		55.3%
Commercial Real Estate Projects	157		13.5%	\$250 million		15.1%
Warehouse & Distribution Centers	180		15.4%	\$227 million		13.7%
Research & Development Operations	37		3.2%	\$72 million		4.4%
Pollution Control Facilities	11		.9%	\$189 million		11.5%
	<hr/>		<hr/>	<hr/>		<hr/>
TOTAL	1,165		100.0%	\$1,652 million		100.0%



**EXHIBIT 6**  
**Insurance Companies and Their Respective Capital Contributions to MCRC**

<u>GENERAL PARTNERS</u>	<u>CAPITAL CONTRIBUTIONS</u>
John Hancock Mutual Life	\$48,449,581
Massachusetts Mutual Life	\$22,859,403
New England Mutual Life	\$17,410,455
State Mutual Life	\$6,039,250
 <u>LIMITED PARTNERS</u>	
Paul Revere Life	\$2,070,277
Monarch Life	\$1,534,457
Berkshire Life	\$1,201,090
Boston Mutual Life	\$427,814
United Educators Life	<u>\$7,673</u>
	\$100,000,000

**EXHIBIT 7**  
**MCRC's Level of Activity Since 1978**

<u>YEAR</u>	<u>NUMBER OF INVESTMENTS</u>	<u>DOLLARS INVESTED</u>
1978	18	\$15.6 million
1979	23	\$17.6 million
1980	19	\$21.1 million
1981	18	\$16.4 million
1982	<u>21</u>	<u>\$18.1 million</u>
	99	\$88.8 million



## EXHIBIT 8

### MCRC's Loans to Traditional and High Technology Industries

#### TRADITIONAL INDUSTRIES

Food & Kindred Products	5.5%
Textile Mill Products	6.8%
Lumber & Wood	3.0%
Paper & Allied Products	3.0%
Printing & Publishing	3.0%
Chemicals	1.0%
Rubber & Plastics	4.0%
Leather	1.0%
Stone, Clay & Glass	3.0%
Fabricated Metals	6.8%
Machinery (non-electric & non-computer)	6.8%
Miscellaneous Manufacturing	<u>5.5%</u>
TOTAL	49.4%

#### HIGH TECHNOLOGY INDUSTRIES

Office, Computing & Accounting Machines	9.5%
Electrical Equipment & Supplies	12.3%
Instruments & Related Products	17.8%
Software & Other Products	<u>11.0%</u>
TOTAL	50.6%

**EXHIBIT 9**  
**MBDC's Annual Lending Volume**

<u>YEAR</u>	<u>AVERAGE AMOUNT PER YEAR</u>
1953 - 1957	\$1.6 million
1958 - 1962	\$1.4 million
1963 - 1967	\$2.7 million
1968 - 1972	\$3.4 million
1973 - 1977	\$2.9 million
1978 - 1982	\$5.4 million
1983	\$14.2 million (including SBA 503 loan commitments)



# THE MASSACHUSETTS EMPLOYMENT AND TRAINING SYSTEM

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## APPENDIX E

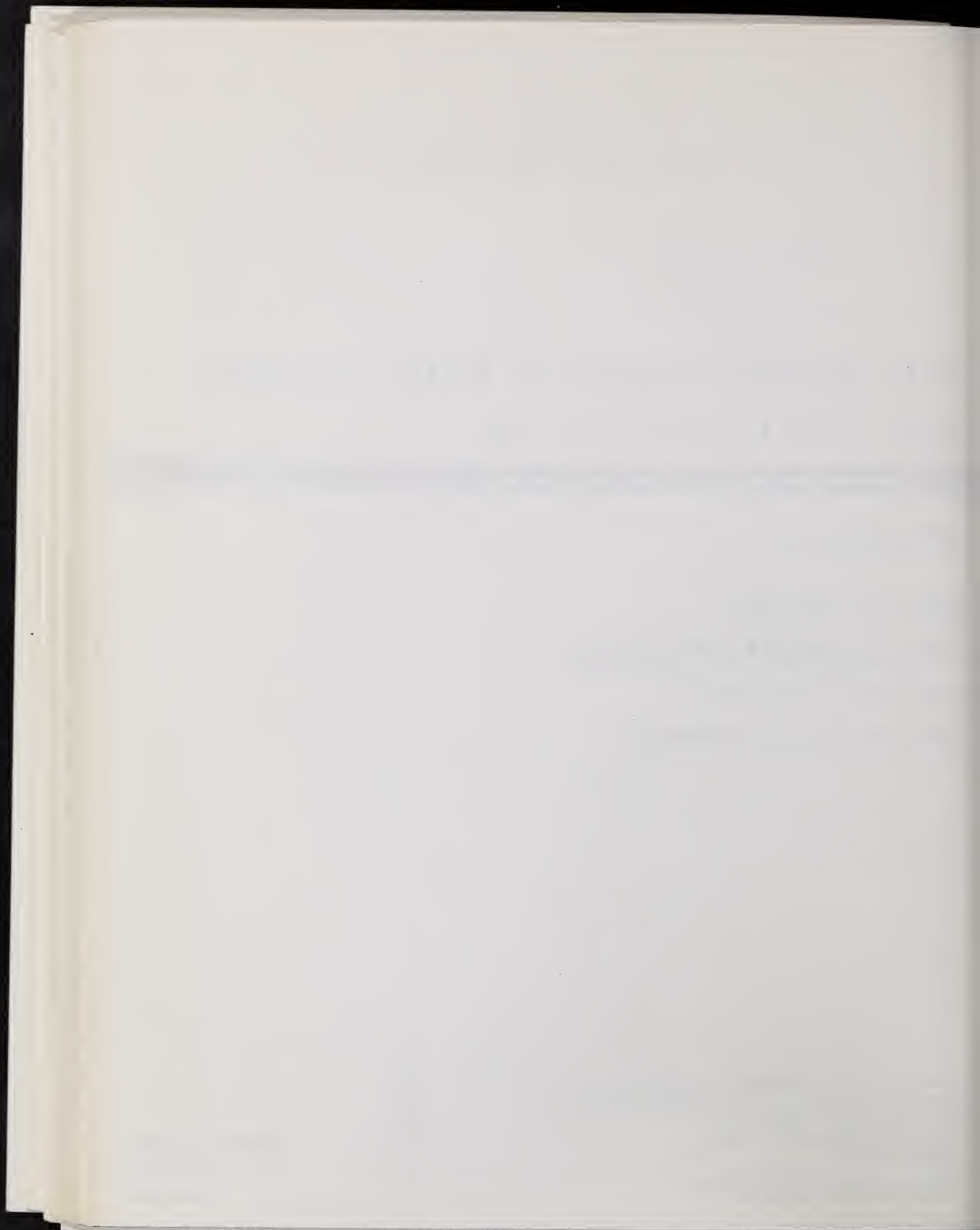
### REPORT OF THE GOVERNOR'S COMMISSION ON THE FUTURE OF MATURE INDUSTRIES

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Michael S. Dukakis  
Governor

June 1984





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## INTRODUCTION

As changes in the nature of the state's economy affect demand for jobs and types of jobs available, effective employment and training (E & T) services become important for assuring the economic strength of the Commonwealth. Although E & T services cannot, in themselves, create employment opportunities, they can develop the potential of workers to fill existing and future job openings. If programs are not successful, firms may have to search elsewhere for suitable employees.

In order to determine appropriate E & T policies for workers in traditional industries, it is necessary first to understand the entire E & T system, how it is currently structured, and what its potentials are. This Appendix describes two primary components of the Commonwealth's E & T system: major public sector programs and models of private sector training efforts. It also describes one particularly innovative program, the Community College Unemployment Tuition Waiver Program.

The existing E & T system was, for the most part, set up to serve disadvantaged workers. Because workers in traditional industries have a different profile, E & T needs are quite different from those of disadvantaged workers. Services particularly important for dislocated workers include:

- upgrading of existing skills to maintain their jobs
- job search and placement assistance for those indefinitely laid off; and
- retraining for new occupations when plants in declining businesses close and there is shrinking demand for workers' current occupations.

Because the emphasis on dislocated workers is relatively new at both the state and federal levels, very little is known about them: how many there are, the effectiveness of various program approaches, the types of services they need, and the appropriate roles of the public and private sectors in meeting those needs. The E & T system is now trying to answer these questions. At the state level, a "Dislocated Workers Task Force" was set up to assess the needs of dislocated workers and propose ways in which the existing public sector E & T infrastructure can assist them.

What has not yet occurred is a comprehensive review of the overall goals and structure of the existing employment



and training system. Some people have proposed that in the future the private sector must provide more short-term support, as well as retraining for dislocated workers. Others have emphasized the need for more integration of economic development efforts with E & T programs. Concepts such as "training accounts" for individual workers who may someday need to retrain for new careers, "training grants" for companies who retain or upgrade workers internally, and new uses of unemployment insurance payments for job creation and retraining have been discussed at the state level. Consideration of such proposals was beyond the scope of this Commission's mandate. This Appendix addresses ways in which the existing public E & T system and some private sector training initiatives can work more effectively to assist workers in mature industries.

#### THE NATIONAL POLICY PERSPECTIVE

Large-scale federal employment policy officially began in the early 1960s. The evolution of the Commonwealth's E & T programs has paralleled that of national policy development. In 1961 "The Area Redevelopment Act" (ARA) was passed. This legislated policy was intended to retrain heads of households who were experienced workers and whose occupations were becoming obsolete because of technological change. The focus of this E & T policy was shifted within a year as more urgent national E & T needs were identified. It became clear that the poor, the young, the undereducated, racial and ethnic minorities, and other disadvantaged groups were in most need of intensive public sector "manpower development" services. The Manpower Development and Training Act was the legislative response to these needs.

While many companies had always trained their own workers, the government recognized that disadvantaged workers needed special assistance to enable them to obtain jobs. During the 1960s, under the Economic Opportunity Act, a number of programs were developed to train and place specific types of disadvantaged workers: The Neighborhood Youth Corps for ghetto youth, Operation Mainstream for adult men, and the New Careers Program which offered professional training for unskilled workers. Subsidies to the private sector enabled employer organizations such as The National Alliance For Business to develop additional E & T programs for the disadvantaged.

In 1973 The Comprehensive Employment and Training Act (CETA) was passed. The service delivery system was changed significantly by decentralizing control of funding and program planning, and decategorizing programs. However the purpose, clientele, and theoretical approaches were similar to earlier programs. The clientele was still the economically and socially disadvantaged. The public sector



was still the primary agent for training, job development, and placement of clients into unsubsidized jobs. In addition, it provided temporary, subsidized public service employment for people unable to find work in the regular labor market.

Toward the latter half of the 1970s, two new concepts concerning the role of the public sector E & T system emerged. The first was that employers had to be involved in program planning and implementation in order to identify real labor demand and train workers to satisfy that demand. Title VII of CETA was enacted to provide for a public/private partnership to meet this need. The second concept was the realization that there were skilled workers whose occupations were being outmoded by permanent industrial change or technological development. They were "dislocated" workers.

In a sense, recognizing the needs of dislocated workers in the late 1970s represented a pendulum swing back to the original ARA goals of nearly 20 years earlier. However, by 1980, there were now two major groups of workers identified as needing intensified assistance: disadvantaged and dislocated workers, each group with their own particular needs. These two groups are now competing against each other for scarce federal funds dispensed to states for E & T programs.

In 1981 The Job Training Partnership Act (JTPA) was passed. This new Act recognized the need to involve representatives of business, industry, labor, and community-based agencies in public program planning. It also acknowledged the need to address the problems of both dislocated and disadvantaged workers. Under JTPA the development of local Private Industry Councils (PICs) was required to advise JTPA service delivery agencies (SDAs) on labor market needs and ways to meet those needs. Title IIa of JTPA provides funds to assist disadvantaged workers and Title III provides funds to assist dislocated workers. JTPA has charged the state E & T system to serve the needs of two distinctly different client groups and to coordinate planning and service delivery efforts of numerous public and private organizations. This mandate is to be carried out with severely curtailed federal funds.

Chapter Two of this Appendix, "The Massachusetts Employment and Training System," provides an overview of major programs and issues raised by the structure of the system. Chapter Three, "Major Public Sector Employment and Training Agencies in Massachusetts," describes those state programs which offer (or have the potential to offer) assistance to dislocated, as opposed to disadvantaged workers. Chapter Four, "The Unemployment Tuition Waiver Program: A Response By Public Higher Education," highlights an innovative effort by the Commonwealth to open up the

resources of its public college system to the long-term unemployed, and offers some ways to improve the program. Chapter Five, "Employer-Based Training Programs," presents models of employer-initiated training programs. The final Chapter summarizes the key policy implications and recommendations drawn from this work.



## THE MASSACHUSETTS EMPLOYMENT AND TRAINING SYSTEM

The present Massachusetts employment and training system evolved as a series of ad hoc responses to perceived E & T needs. Its somewhat confusing configuration reflects the national government's lack of a comprehensive plan for responding to the continually changing employment effects of economic change.

Because of the lack of a comprehensive E & T policy, sorting out the specific roles of each of the many organizations that contribute to the Commonwealth's E & T efforts is difficult. At present, the Massachusetts E & T system has hundreds of programs operated by numerous public and private sector organizations at the state, regional, and local levels. Each program provides one or more services to workers, employers, or other service providers to satisfy both the demand and supply needs of the Commonwealth's labor market.

The system includes state level public agencies, regional and local offices of those agencies, private non-profit agencies, quasi-public agencies, labor organizations, individual firms, employer confederations, and community-based service organizations.

The services which the system provides include:

- Workers - needs assessment, skill assessment, program eligibility determination, career counseling, job search assistance (including provision of labor market information), job development, vocational training or retraining, and job placement
- Employers - access to labor market information, identification of suitably trained workers, out-placement services, worker training and retraining for specific employer needs, subsidies for in-house service provision, and educational and training program planning assistance; and
- Other Employment And Training Service Providers - access to labor market information, supportive services to complement agency services, and inter-organizational coordination assistance.

The Commission has assembled information on selected E & T programs in the Commonwealth. Included are public or quasi-public agencies which operate on a state-wide basis and

administer and/or fund local-level service delivery operations. Exhibit 1 identifies all major state agencies that provide E & T services, the executive offices under which they operate, and their organizational relationships to other state level agencies. The organizations which are discussed in this report are enclosed in boxes. They are:

- The Division of Employment Security (DES), within the Executive Office of Economic Affairs
- The Job Training Partnership Act Office (JTPAO), within the Executive Office of Economic Affairs
- The Division of Occupational Education (DOE), under the Massachusetts Department of Education
- The Bay State Skills Corporation (BSSC), a quasi-public organization, funded by the Massachusetts State Legislature
- The Regional Community Colleges, under the Massachusetts Board of Regents
- The Division of Apprentice Training (DAT), within the Executive Office of Labor
- The Department of Public Welfare (DPW), within the Executive Office of Human Services
- The Department of Elder Affairs (DEA), within the Executive Office of Elder Affairs; and
- The Department of Community Development (DCD), within the Executive Office of Communities and Development.

These specific organizations are reviewed because they provide E & T services particularly appropriate for workers affected by industrial change. Only permanent programs or services directly related to E & T needs are discussed. Not included are time funding programs or programs serving categorical groups and others such as the mentally retarded or ex-offenders. Also omitted are community-based agencies that provide direct or referral services at the local level. Private firms, business associations and labor unions offering E & T services are also not included.



Exhibits 1 through 5 include:

- the organizational relationships of the state agencies providing E & T services (Exhibit 1)
- the services provided (Exhibit 2)
- the specific client groups served by each provider (Exhibit 3)
- the programs and number of delivery sites of each provider (Exhibit 4); and
- the fiscal year 1984 funding levels of each program (Exhibit 5).

Included in these programs are two which are targetted primarily for dislocated workers: Title III of JTPA and The Trade Adjustment Assistance Program. Some Bay State Skills projects are also for dislocated workers. Other programs, although not specifically for these people, are open to them.

The structure of the public E & T system and the mandates of many programs in it raise several issues:

- Because the system is fragmented, people needing services are often referred to several agencies. This can be disorienting and confusing. In addition, workers may not learn about or receive all available services.

From the public's perspective, this fragmentation probably increases the costs of service provision, fostering duplication of efforts and competition--which may or may not be productive--between agencies.

- Many community-based resources are being under-utilized. One example is the vocational/technical schools. Although they have participated in Bay State Skills programs, they have not been involved as much as possible in the JTPA system. Representatives of the Division of Occupational Education are often not members of local PICs. More coordination could help utilize existing programs to meet the needs of dislocated workers.
- Assuring the exchange of labor market information (LMI) among all relevant agencies is made difficult. Sometimes such information is not used because organizations do not know it exists.

- The PICs, with a mandated 51% local business membership, are a big step towards coordinating employer needs and resources with program design and implementation. However, it is often difficult to elicit sufficient voluntary employer participation. Programs which require active employer participation, such as Bay State Skills contracts, the apprenticeships monitored by the Division of Apprentice Training and cooperative education programs have the highest success rates in placing workers.

Some firms are reluctant to get involved in public training programs because of administrative requirements. Often smaller firms are reluctant because they do not want to allocate resources to training when trained workers are then likely to be hired away by better paying firms. In addition, firms are often unable or hesitant to forecast long-term labor needs.

- While some programs, such as the apprenticeships or work-study programs pay wages to trainees, most public sector programs do not. According to the State Unemployment Compensation Law, workers eligible for Unemployment Insurance (UI) benefits who require retraining to become employable, may receive them. However, implementation of this law is not consistent because local Employment Service offices have not always interpreted the law as liberally as possible. (DES is currently addressing this.)
- The lack of support resources, such as allowances for books, transportation, and child care, have prevented workers from making use of training programs.

The recommendations of the Commission, in conjunction with those of the Dislocated Workers Task Force, address these issues. The following chapter of this Appendix summarizes the nine major public employment and training agencies of the Commonwealth.



## MAJOR PUBLIC SECTOR EMPLOYMENT AND TRAINING AGENCIES IN MASSACHUSETTS

The following briefly describes the primary public sector training programs in the Commonwealth.

### THE DIVISION OF EMPLOYMENT SECURITY (DES)

#### Program Activities

DES has three primary functions:

- Unemployment Insurance (UI) Service - assesses eligibility of unemployed workers for UI benefits and provides benefits to insured workers.
- Employment Service - provides skill assessment, job counseling, job search, job development, and placement services for job ready workers; and assists employers in identifying qualified workers to fill job openings. It also refers workers needing training and other services to appropriate agencies.
- Labor Market Information Research - collects, analyzes and disseminates data on labor market trends in Massachusetts, including industrial, occupational, and regional changes in labor demand and supply and wage rates.

In addition to these basic activities, DES administers two special programs:

- Trade Adjustment Assistance Act Program - payments to workers displaced because of foreign competition. (Payments to firms affected by foreign trade are made through the Department of Commerce and Development.)
- Veterans' Services - specific employment service programs for veterans. Ninety of the 400 employment service specialists are assigned to work specifically with veterans. (This was a short-term program.)

#### Program Participants

The Employment Service is mandated to serve all unemployed workers, and to assist all interested employers in finding qualified workers. The UI Program provides benefits to all insured unemployed workers for a mandated length of

time. Under other mandates or through special contracts, DES also provides intensive services for disadvantaged workers, welfare recipients, veterans, dislocated workers, and handicapped workers.

#### Funding

In fiscal year 1984, DES received \$31.6 million from the U.S. Department of Labor to administer the Unemployment Insurance Program. (This figure does not include claims payments to clients.) The Division received an additional \$24.4 million to administer the Employment Service. DES also contracted with the Massachusetts Department of Public Welfare for \$5.1 million to provide employment services to welfare recipients. An additional \$3 million in federal funding was designated for veterans programs.

#### System Coordination

DES provides skill assessment, job search, job development, and placement services for clients from many other agencies. It has service provision contracts with the JTPA office, the Department of Public Welfare, the Massachusetts Rehabilitation Service, and the Veterans Administration. Under JTPA legislation, DES must work with local PICs/SDAs and with the JTPA office to develop and administer service delivery plans for both disadvantaged and dislocated workers.

DES is considered to be the primary source of labor market information by most service delivery agencies in the state, as well as by many workers and employers. DES is developing plans to integrate and format existing labor market data to meet the needs of SDAs and other service providers better.

Historically, the Employment Service has served as an intermediary between employers and job seekers through its job matching function. DES is also studying ways to use the unemployment insurance system for payment of partial benefits to workers temporarily on reduced work schedules (short-time or shared-work), to finance the training of workers collecting unemployment compensation, and to help finance economic development to promote job growth.

#### THE JOB TRAINING PARTNERSHIP ACT OFFICE (JTPAO)

##### Program Activities

JTPAO is responsible for administering the federal Job Training Partnership Act at the state level. The Executive Office of Economic Affairs makes policy and allocates the budget for specific programs. Except for some demonstration



programs, program planning occurs at the local level within the JTPAO's 15 service delivery areas (SDAs) throughout the state. Each SDA has a Private Industry Council (PIC), composed of representatives of local employers (at least 51%) labor unions, local offices of state agencies, and various community-based agencies. The PICs develop policy and programmatic strategies for their respective SDAs.

JTPA includes several titles, each aimed at particular groups of workers. Title IIa mandates E & T programs for the economically disadvantaged. Title IIb provides summer employment opportunities for disadvantaged youth. Title III mandates services for dislocated workers: people laid off because of plant closings or mass layoffs and those whose occupations and skills are becoming obsolete. Title IV authorizes E & T programs for selected target groups. Title IVc mandates services for veterans.

Most SDAs provide development services such as counseling, skill assessment, job search assistance, and some in-house vocational training services. Additional job development and job search services, as well as job placement, are provided by local employment service offices within DES. Contracts for vocational training services are often developed with vocational/technical training institutions and community colleges.

#### Program Participants

Any person who meets a low income criterion is eligible for Title IIa programs. Ten percent of the people served by each SDA do not have to meet that criterion, but must have encountered severe barriers to employment. Any economically disadvantaged person aged 16 - 21 is eligible for Title IIb summer youth programs. Participants in Title III Programs must be laidoff workers who are unlikely to find work in their previous occupations because of declining demand or outmoded skills.

#### Funding

JTPAO receives all of its funds from the U.S. Department of Labor. In fiscal year 1984, \$29.3 million was received for Title IIa Programs. Of this amount, \$22.8 million is available for local level programs with the remaining \$6.5 million reserved for discretionary use at the state executive level. Funds are distributed to the PICs/SDAs partially as formula grants and partially in response to RFPs. Proposals for funding are jointly selected by the JTPAO and the Executive Office of Economic Affairs. Some discretionary funds will be used to supplement local level budgets or to fund state-wide or local demonstration programs.

In fiscal year 1984 \$1.4 million was received under Title III legislation. Title III allocations must be equally matched from local private or public sources, which may be either money or in-kind services. Up to 50% of this match may consist of UI benefits paid to Title III participants.

#### System Coordination

The PIC system is the primary source for coordination within the JTPA system. PICs are expected to provide the mechanism for joint decision-making and program planning at the local level. Through the joint efforts of local PIC members, LMI is shared and the needs and resources of various interest groups can be communicated, responded to and utilized. PICs are expected to provide the mechanism for joint decision-making and program planning at the local level.

### THE DIVISION OF OCCUPATIONAL EDUCATION (DOE)

#### Program Activities

DOE, within the Massachusetts Department of Education, administers the Commonwealth's vocational education system. DOE approves vocational training programs developed by over 250 schools in the Commonwealth, including 46 secondary vocational/technical schools. Many of the vocational/technical schools offer post-secondary programs. DOE allocates federal funds for targeted populations. It also develops some programs, as well as specialized curricula and instructional materials, for state-wide use.

Two types of training programs currently operating within the vocational education system are especially appropriate for many adult workers. They are:

- regular post-secondary adult vocational education programs, developed and administered by 23 regional vocational/technical schools and
- adult short-term vocational training programs, developed by the vocational/technical schools in response to RFPs issued by DOE.

The regular adult post-secondary programs offer training in a variety of skill areas. Under state law, programs in each school must be monitored by an advisory committee comprised of representatives from business, labor, and other groups. The program committees assess the need for new program development, job opportunities in that vocational area, and program content.



The adult short-term occupational training programs were developed in response to a 1983 federal directive with funding for such programs. Nineteen programs have been approved and awarded grants. The programs are targeted to specific worker groups and require no more than one year to complete. Each program provides skills required for a particular occupation.

In addition to these programs, DOE funds the administration of the Division of Apprentice Training and the administration of programs for displaced homemakers and incarcerated adults. It also provides some materials and financial reimbursements to vocational/technical schools for regular secondary-level occupational education programs.

#### Program Participants

Participants in post-secondary occupational training programs must have high school diplomas or their equivalent. The short-term vocational training programs are targeted to specific population groups including the economically disadvantaged, handicapped, minority group members, females, and people not proficient in English.

#### Funding

DOE allocates federal money received under the federal Vocational Education Act. In fiscal year 1984, \$1.7 million was allocated as formula grants to regional school districts for regular programs, \$1.3 million was allocated to community colleges, \$976,000 was allocated for adult short-term training programs, \$400,000 to the Division of Apprentice Training, \$250,000 for programs for incarcerated adults, and \$200,000 for displaced homemaker programs.

Also under Chapter 74 of The Massachusetts Vocational Education Act, DOE reimburses regional schools for the costs of locally funded programs.

#### System Coordination

DOE has funding linkages with community colleges and several state agencies. The displaced homemaker programs operate in conjunction with the five regional service centers funded by BSSC. Representatives of DOE serve on many of the PICs under JTPA. DOE uses LMI provided by DES for program planning purposes. Individual vocational/technical schools within the Commonwealth's occupational education system have trade area program committees comprised of representatives from business and labor organizations and other concerned parties.

## BAY STATE SKILLS CORPORATION (BSSC)

### Program Activities

BSSC is a quasi-public organization funded by the Massachusetts Legislature in 1981. BSSC administers five programs:

- Skills Training Contracts - developed jointly by employers and local educational institutions to train workers in specific skills needed by firms
- Supported Work Programs - job training for gradually increasing the work skills of mentally retarded workers
- Computer Camps - exposure to computers for JTPA eligible youth through the summer youth employment program
- Displaced Homemaker Programs - skill assessment, job search skills, training and job placement for homemakers seeking entry or re-entry into the labor market; and
- Programs For Welfare Recipients - primarily to provide training and placement for welfare recipients.

Of these five programs, skills training contracts are most appropriate for dislocated or potentially dislocated workers. Under this program, an employer and a local educational institution make a contractual agreement to train workers for specific skills required by the firm. Training programs are developed jointly by these contractors. BSSC functions as a broker, bringing together employers needing trained workers, public educational institutions, and workers needing training or re-training. (See the section "Models of Employer-Based Training Programs" for descriptions of several BSSC skills training programs.)

### Program Participants

Most skills training programs are open to all workers seeking employment. However, because individual program contracts are developed to meet the needs of sponsoring firms, eligibility is often determined by the firm's needs. Workers may be required to have basic skills in order to qualify for training in particular occupations. Some program contracts have been targeted toward particular worker groups, such as disadvantaged workers, minority group members, or public sector employees who have been laid off. Some other programs have been developed to retrain or upgrade the skills



of employed workers, enabling them to transfer to other jobs, either to avoid layoffs or to upgrade their positions.

BSSC supported work programs serve only mentally retarded workers. Displaced homemaker programs are available only to homemakers (almost always women) who require training or job search assistance in order to enter or re-enter the labor force. Programs for welfare recipients are available only for persons requiring income maintenance from the Department of Public Welfare.

### Funding

BSSC receives funding directly from the State Legislature for its skill training programs, displaced homemaker programs, and supported work programs. In fiscal year 1984 these funds totaled \$3.2 million: \$1.5 million for skills training, \$1.1 million for supported work, and \$550,000 for displaced homemaker programs. BSSC awards individual contracts to educational institutions for specific skill training programs. Proposals for these contracts must be submitted jointly by the educational institution and a firm which requires skilled employees to be trained in the programs. The firms must provide funds to match the amount allocated by BSSC for the program.

BSSC has recently received \$800 thousand from the DPW to develop and operate specific training and placement programs for welfare recipients, including displaced homemakers.

### System Coordination

BSSC is considered a model of intersectorial coordination of E & T. It has effectively brought together training providers and firms with labor needs, by matching training to real job demand. By requiring employers to participate in training program planning and funding, BSSC's approach greatly improves the likelihood of placement after training.

## THE COMMUNITY COLLEGE SYSTEM

### Program Activities

The Community College System consists of 15 independent regional institutions operated under the Massachusetts Board of Regents. Community colleges offer two types of programs: Associate Degree programs and Certificate programs.

Associate Degree Programs: These two year programs grant Associate of Arts, Associate of Science, or Associate of Applied Science degrees. Associate of Arts programs focus on the liberal arts, and most graduates transfer to four year



college programs. Many Associate of Science and Applied Science programs provide students with technical training for specific occupations. For some occupational areas, students are job-ready with such an Associate Degree. Increasing numbers of Associate of Science and Applied Science Degree holders are transferring to four year college programs.

Certificate Programs: These programs provide students with particular skills required for specific occupations. Length of training varies from several weeks to two years depending on the degree of skill required. These programs provide certificates acknowledging the student's mastery of skill areas.

In addition to Associate Degree and Certificate programs, community colleges offer a variety of workshops and individual courses which provide training in particular skill areas. Degree and Certificate courses are usually offered in the regular college program (during the day) and also in the continuing education program (usually after working hours).

The Associate of Science and Technical/Vocational Certificate Programs are most relevant for the training or re-training of dislocated workers. These programs are usually directed toward specific skill development and vocational preparation. They also take less time and cost less than four year college programs.

The appropriateness of Bachelor Degrees or even graduate training for dislocated workers should not be minimized. There is certainly demand for highly skilled workers requiring advanced college degrees. However, the scarcity of public training funds makes it unlikely that there will be significant subsidy of such costly advanced college training. Therefore, these advanced training options are not discussed here.

#### Program Participants

Any person who has a high school diploma or its equivalent can enroll in a community college program. Some technical programs have additional requirements such as prior completion of particular courses. Most students in regular day school programs are recent high school graduates. Most people in continuing education programs are adults with jobs during the day. Courses are open to community residents, regardless of their previous educational training, if there are spaces available. Degree candidates are given priority for courses in degree programs. Non degree candidates may enroll as space is available.

Under a directive from the Board of Regents, many community colleges have recently instituted the Unemployment Tuition Waiver Program to enable unemployed workers to take a



certain number of tuition-free courses. They must first receive eligibility certification from their local DES office. Certified candidates can continue to receive their unemployment compensation entitlements while enrolled in courses. (See below "The Unemployment Tuition Waiver Program: A Response By Higher Education" for a description of this program.)

### Funding

The community colleges receive the majority of their funds from state government, administered through the Board of Regents. In fiscal year 1984, the total state appropriation for community colleges was \$82 million. Of this amount an estimated 64%, or \$54 million, was allocated for "career oriented" technical/vocational programs, including Associate Degree and Certificate programs. State appropriations are allocated only for regular day school programs. The continuing education programs are entirely self funded by student tuition (about \$14 million in academic year 1981 -1982).

In addition to state allocations and tuition, the community colleges receive funds from other sources. In fiscal year 1984 \$1.25 million in federal money was allocated through the Massachusetts Division of Occupational Education. Individual colleges also received funds from service contracts with local CETA Prime Sponsors in the past and now from SDAs under JTPA. The funding amounts vary from one region to another.

Private corporations have funded some specific short-term training programs. A few colleges have received funding from Bay State Skills Corporation for training programs developed jointly by the college and a local firm; these are financed by the firm and with public funds through BSSC.

### System Coordination

The community colleges interact with various funding sources. The Board of Regents and the Division of Occupational Education must approve documentation of demand for occupational training courses which they fund. Demand is determined primarily by projected or demonstrated job placement rates for program graduates.

Individual community colleges have contracts with PICs, BSSC and firms to operate particular training programs. Such contracts are attractive because coordination is almost completely at the local level.

## THE DIVISION OF APPRENTICE TRAINING (DAT)

### Program Activities

DAT, within the Executive Office of Labor, monitors the conditions and training standards of apprenticeships established under the Commonwealth's apprenticeship law. There are currently about 6,250 apprenticeship positions in a variety of work settings throughout the Commonwealth.

Apprenticeship training has traditionally been used to prepare workers for occupations requiring mastery of manual or technical skills. An apprenticeship combines on-the-job experience with classroom training. An employer and a worker sign a non-binding agreement in contract form which must conform to state regulations. Under Massachusetts law, in return for a worker's labor the employer must:

- provide at least 2,000 hours of supervised on-the-job training related to the skill area to be learned
- make arrangements for at least 150 hours per year of related instruction (usually classroom instruction provided by an educational institution)
- pay at least the minimum wage rate as a starting apprentice wage
- pay a progressively increasing wage rate consistent with the skills acquired during training
- make periodic evaluations of the apprentice's progress
- obtain, where applicable, the consent of the trade union representing the apprenticed occupation to the terms of each relevant apprentice program; and
- employ the apprentice full-time and provide full fringe benefits during the apprenticeship.

Through direct contacts with employers, DAT receives information about needs for workers and apprenticeship openings. Division staff are available at the local job matching offices of DES to assess and counsel workers and to refer qualified workers to available apprenticeship programs. Field staff monitor apprenticeships to ensure contract compliance and to offer general assistance.



### Program Participants

Apprentices must be at least 16 years old with no legal upper age limit. Specific skill and educational requirements for entering apprentices are set by employers.

### Funding

DAT is funded by the state through DOE's, Division of Occupational Education. Funds are used for administration at the state level and for allocations to vocational/technical schools which provide classroom training for apprentices. In fiscal year 1984 DAT received \$400,000.

### System Coordination

DAT confers with the Massachusetts Apprenticeship Council on policy decisions and on the setting and monitoring of apprenticeship standards. Under Massachusetts law, the Council must include a representative from DES, the Director of the Division of Occupational Education (both ex-officio members), and six members appointed by the Governor. Three of the appointed members must represent employers and three must represent labor.

The Division maintains contact with employers through its field staff. Division staff also work with the local staff of DES to place eligible workers in apprenticeships. DAT approves programs proposed by employers, employer associations, unions, and union-management groups; and monitors the related instruction offered in conjunction with the approved programs. When a bargaining agreement exists, the union must either participate or waive participation before approval is granted.

## THE DEPARTMENT OF PUBLIC WELFARE (DPW)

### Program Activities

DPW administers the Aid to Families with Dependent Children (AFDC) Program in Massachusetts. In addition to income maintenance and social support services, the Department provides E & T services through the Work Incentive Program (WIN). The DPW has recently received federal and state funding to operate a demonstration E & T program for WIN registrants. The program is administered by the Department, which makes contracts with various agencies for services.

### Program Participants

Five client groups have been targeted for participation in the new E & T program. They are:

- AFDC principal earners in two parent families of which many may be dislocated workers (2,940 cases)
- voluntary participants of which some are mandatory registrants, including those people who have no children under 6 years of age (73,015 cases)
- women with children between the ages of 14 and 18 (10,271 cases)
- pregnant teenage girls and teenage mothers who volunteer to participate (8,428 cases); and
- teenage children in AFDC families (17,272 individuals, aged 16 to 18).

The goal of the program is to serve 24,000 clients annually, of which 8,000 would be placed in jobs. (During the first year, the figures will be lower, allowing for program start-up.)

#### Funding

DPW received \$19.5 million to initiate its new E & T program. Of this amount \$10.7 million are state funds and \$8.7 million are federal funds. Most of these funds will be allocated to other agencies for contracted services. Exhibit 6 lists the allocations. In addition to these funds, \$11.2 million will be allocated to JTPA and \$.5 million to BSSC for continuing services to AFDC recipients.

#### System Coordination

DPW contracts with other organizations for most E & T services for clients. In addition, it is working closely with DES and JTPA PICs to obtain relevant labor market information.

### THE DEPARTMENT OF ELDER AFFAIRS (DEA)

#### Program Activities

DEA provides a variety of services for the elderly. The Department operates two employment programs for older workers: The Elder Service Corps and the Senior Aides Program.

- The Elder Service Corps - is a volunteer program which places workers in positions around the state. Workers do not receive wages but are paid \$120 per month for expenses. In fiscal



year 1984, there were 550 available placements in this program.

- The Senior Aides Program - is a part-time employment program open to all low income persons aged 55 years or older, who have been unemployed for three months or longer. Operated under Title V of the U.S. Older Americans Act, the federal program is called the Community Service Employment Program. In fiscal year 1984, 304 jobs have so far been created in public and private non-profit organizations under this program.

#### Program Participants

General services are available for all elderly persons aged 55 years and older. The Elder Service Corps Program is open to all older persons. In order to be eligible for the Senior Aides Program, a person must have been unemployed for three months or longer and must be considered to be low income according to the federal definition contained in the Older Americans Act.

#### Funding

DEA receives appropriations for its operations from both state and federal budgets. In fiscal year 1984, it received \$792,000 from the state for payment of expense allowances to participants in the Elder Service Corps. In fiscal year 1984, DEA received a total of \$1.8 million from the federal government under Title V of the Older Americans Act for the Senior Aides Program. These funds were used as wages for part-time workers in the Program.

#### System Coordination

Local offices of DEA maintain communication with those community agencies which provide support services as well as employment opportunities for DEA program participants. Together with the JTPAO, DEA is co-sponsoring a request for proposals to provide E & T services to elderly disadvantaged workers. The RFP is being issued in accordance with JTPA regulations which require that a portion of state-administered Title IIa funds be appropriated for E & T services for economically disadvantaged persons over 55 years old.

#### THE EXECUTIVE OFFICE OF COMMUNITIES AND DEVELOPMENT

The Massachusetts Department of Community Development (DCD), within the Executive Office of Communities and

Development, has allocated funds for E & T programs and support services in fiscal year 1984.

#### Program Activities

The Department's programs include:

- Supportive Services - funding to five municipal housing authorities in fiscal year 1982, renewed in fiscal years 1983 and 1984
- General Education Degree (GED) (high school equivalency degree) and Vocational Training Services - funding allocated to 11 municipal housing authorities covering 12 communities; and
- Employment and Training Program for Youth - funding allocated to 11 municipal housing authorities.

#### Program Participants

All three programs are targeted to public housing residents. The first two programs serve adults, the third program serves youths, aged 16 to 21.

#### Funding

Two million dollars in funding for the Supportive Services Program came from the Federal Jobs Bill enacted in 1983. Some of that allocation has been carried over into fiscal year 1984 and supplemented by an additional \$1 million allocation. Funding for fiscal year 1984 for the newly created GED Program is \$2.3 million. Funding for the Youth Employment and Training Program in fiscal year 1984 is \$500,000.

#### System Coordination

DCD allocated funds by an RFP process to 11 municipal housing authorities. Because two cities submitted a joint proposal, the allocations cover 12 municipalities. Each of these housing authorities have contracted with PICs or, in some cases, with local vocational education schools, to provide E & T services to clients.



## CONCLUSIONS

This brief review of the Commonwealth's major public sector employment and training programs shows a bewildering array of programs, some with overlapping goals and client groups. Many of these programs were developed in response to separate federal mandates. The extent to which they have been successfully adapted to the needs of the Commonwealth is unclear. They represent millions of dollars of resources, yet there is no single coordinating body to assure that as a whole, they are as effective as possible.

As mentioned earlier, dislocated workers represent a relatively new client group for the E & T system. While it is too early to judge the effectiveness of newer programs, one thing is clear: the system must be flexible enough to experiment with new approaches to meet the particular skill assessment, job placement and retraining needs of dislocated workers.

In order for the E & T system to work more successfully, improvements should be made in the following areas:

- labor market information
- state-level E & T strategy
- coordination among service providers
- maximizing input from the business community;  
and
- sufficient funding levels.

### Labor Market Information (LMI)

Any effective planning of E & T programs requires accurate statistics on current and future labor demand, as well as the numbers of workers in various target groups. This information must be aggregated at the regional level to be useful to program planners. Currently the number of displaced workers in Massachusetts is not known. Efforts are being made by some of the PICs to gather this information. DES can help lagging PICs develop the data base they need to design programs.

In general, the LMI collected by DES needs to be made more useable for program planners, employers, and workers who rely on it. Some of the improvements are minor: publicizing existing data, including contact people on documents and reformatting data which already exists. Others are more fundamental. Regional data packages should be developed. Computer programs to track specific labor market trends and groups of workers for special studies or demonstration

programs, particularly for economic development purposes, should be initiated.

#### State-Level Employment And Training Strategy

Although it was not this Commission's function to study the purpose, goals and policies of the E & T system, it became clear during the Commission's work that the current melange of programs have not been considered as a whole. Resource allocation, particularly during this period of funding cutbacks, becomes a critical issue as the system is now being expanded to develop services for dislocated as well as disadvantaged workers. Service providers generally believe that improvements are possible in responding to the needs of both groups.

An overall employment and training strategy should address the needs of individual categories of workers, determine effective approaches, and set funding priorities. Such a strategy should especially consider the long-term unemployed--those people no longer covered by unemployment insurance benefits and are therefore outside the current system. This strategy should be formulated by people at the highest state level, and should include participation of all major E & T agencies.

#### Coordination Among Service Providers

The need for effective coordination of programs is evident from the agency descriptions. Although there are funding relationships and some cooperation among agencies, improving this could mean more effective use of resources and better service for clients. At the local level, the PICs are in the position to provide this, through their relationships with agencies within their region. At the state level, coordination should be a result of a coherent E & T strategy.

#### Maximizing Input From The Business Community

The involvement of the business community is essential to the success of the E & T process. By involving firms in the design of training programs, a better assessment can be made of skills in demand. Similarly, a placement system that is sensitive to the needs and concerns of business makes the public sector referral process that much more efficient.

A number of things can be done to encourage firms to get involved in the planning and utilization of E & T programs. Much of this involves little more than common sense. Minimizing bureaucratic issues and administrative requirements would make the E & T system more attractive to firms. On a more formal level, the state could encourage participation by linking certain forms of state assistance to training, retraining and hiring policies. Businesses will be



motivated to get involved in E & T programs when state funds for expansion and new plant and equipment, such as MIFA and MCRC, encourage them to make efforts in training, retraining and hiring policies.

### Sufficient Funding Levels

Title III JTPA funding has been used in a variety of ways to assist dislocated workers: Worker Assistance Centers for long-term unemployed, plant closing assistance for workers currently losing their jobs, and Cooperative Regional Industrial Laboratories to promote job creation.

The Worker Assistance Centers provide training and placement assistance for workers who have been unemployed 15 weeks or more. Currently there are five centers, all in areas where the unemployment rate is over 20% greater than the state average. Three additional such areas do not have centers, due to lack of funding and sufficient local capabilities to design and run such a program.

Assistance in plant closing situations has been through the Massachusetts Emergency Response Team (MERT). It has focused on supplementary assessment, placement, and training programs for workers caught by massive layoffs or closings. Lack of funding has limited the number of cases in which MERT could effectively intervene. In addition, JTPA funds are restricted in their use and MERT's experience has shown the need for more flexible use funds for special situations requiring counseling and other support services, medical care needs, and education as opposed to training.

The Cooperative Regional Industrial Laboratories (CRIL) Program is a new experiment in supporting unemployed workers in selected industries to identify new employment opportunities. There is one program in operation in Greenfield and there are more in the planning stages. Lack of funds may limit their implementation. The funding of these programs required a combination of 1983 and 1984 JTPA monies. Unless federal funds for 1985 are somehow supplemented, these limited efforts will have to be cut back.

In its recommendations, the Commission addresses the need to better assess the state's E & T system and proposes ways in which to make it function better.

The next two sections of this Appendix examine some other approaches to the E & T needs of workers which are particularly applicable to those in mature industries: the

Unemployment Tuition Waiver Program and models of private sector training programs.

## UNEMPLOYMENT TUITION WAIVER PROGRAM: A RESPONSE BY PUBLIC HIGHER EDUCATION

Public educational institutions have long been an important element in responses to the problems and training needs of the unemployed. Non-degree programs, extension courses, and special programs sponsored by BSSC are three examples of how public educational institutions are involved in local manpower affairs.

A relatively new program, the Massachusetts Board of Regents' Unemployment Tuition Waiver Program is a direct response to the needs of the unemployed. It demonstrates how public educational resources can be used to address local needs.

### PROGRAM OVERVIEW

In January 1983, the Board of Regents of Higher Education inaugurated a program intended to provide unemployed workers in the Commonwealth with tuition-free access to courses at public colleges and universities in or near their local communities. The Unemployment Tuition Waiver Program was developed with the cooperation of DES and was modeled after an innovative project which began at Greenfield Community College.

Under the program's general guidelines, public institutions could waive the tuition for 11 to 15 college credits (three to five courses) for individuals who were either at or near the end of their unemployment benefits. Participants would be identified by the college and then referred to DES for certification. They agree to continue seeking employment and remaining available for work as long as their benefits last while attending school. The Regents continued the program through the 1983 - 1984 academic year, providing about \$1 million in waivers during that period.

Individual institutions differed greatly in how they interpreted program guidelines and adapted the program to their communities' needs. Greenfield Community College's program, "Project Future" demonstrates what is considered a successful program.

### PROJECT FUTURE: AN EXAMPLE OF THE UNEMPLOYMENT TUITION WAIVER PROGRAM

Profound changes in the cutting tool industry have idled veteran workers and closed off employment opportunities for younger workers in the greater Greenfield area. Project



Future developed out of an ongoing dialogue between educators, community and union leaders, human services providers, and manpower professionals in the county. Each agreed to contribute something in order for the college's program to succeed. Using funds raised in the community, the college provided the unemployed with free books and waived the non-tuition fees for the first semester--something participants at other colleges have repeatedly requested. Finally, it offered individualized educational programming, comprehensive advising, career counseling, life experience credit, and free tutorials. These services provided a safety net for workers adjusting to unfamiliar academic terrain.

These workers had to confront the fact that their skills were no longer in demand. To find work, they had to develop new skills. As a first step, they used the college counseling services to determine their aptitude and abilities. They then had to decide whether they wanted education or training. Many found a way to acquire both.

By combining regular academic courses and informal workshops in the evening division, Project Future helped participants integrate themselves into the college, pursue two-year associate degree programs and at the same time, satisfy their need for short-term skills-oriented classes in occupational areas like real estate, office management, and printing. This resulted in a return rate of 49% between the first and second semesters of the program, and the graduation of the first participant at the end of the fall semester.

As mentioned earlier, the program takes different forms on the college campuses. The following is a summary of the program to date, with examples of how the program was implemented on various campuses.

#### THE UNEMPLOYMENT TUITION WAIVER PROGRAM TO DATE

A fall semester survey of college and university officials in charge of the program at each of the 22 participating campuses yielded the information contained here on enrollments, course choices, counseling and other support services as well as inter-agency cooperation. Program Administrators were asked how effective they thought the program had been on their campus, and whether there had been any serious obstacles to its implementation. Their comments form the basis for the recommendations presented later.

Since January 1983, an estimated 1,500 unemployed people have participated in the Program. During the fall, enrollments ranged from a low of four at Salem State College to a high of 101 at Bristol Community College in Fall River. Each semester, the program attracted as many male as female students, predominantly attracting 25 to 35 year olds. Most



of the participants were white. No firm data on educational background or prior work history were collected by administrators, but with a few regional exceptions--large concentrations of tool and die makers in Franklin County and unemployed teachers on the South Shore--participants represented a broad mix of occupational backgrounds. That mix made individualized programming essential on the campuses, where dozens of additional counselors were recruited to process applicants at special registration sessions.

The program took on a different character at each campus. It was called the OPEN Program (Opportunity for Education Now) at Berkshire Community College and Project Concern at Worcester State College. On other campuses, it simply took the form of a financial assistance mechanism, with no name and no real definition.

Several campuses allocated their own resources to pay for extra course sections set up to handle the increased enrollments, but most colleges only offered courses to participants on a space-available basis in accordance with the Regents' guidelines.

Most participants enrolled part-time. Typically, they requested course work in either business or computer science, regardless of personal aptitude, prior knowledge or experience, or actual demand for those kinds of skills in the local labor market. When these courses were closed to them because of their popularity with regular undergraduates, participants were required to make alternate selections, which many found frustrating.

Several colleges administered placement tests to determine participants' skill levels. At Bristol Community College, testing revealed that 30% of the fall semester group needed developmental work in English and math before they could enroll in college level courses in career-related degree programs.

Participants took advantage of the personal development and career counseling courses offered in abundance at most of the institutions. These courses included resume writing, assertiveness training, and interviewing techniques. At Cape Cod Community College, Project Up students attended a weekly support group for older and re-entering students to discuss issues like time management, study skills, single parenting, and to share personal coping strategies with one another.

Few campuses kept accurate statistics on how many or why students withdrew each semester, although in most instances officials presumed that students had either located jobs they wanted or were obliged to accept work and leave school. In a number of cases, however, campus contacts suggested that a



significant number of students withdrew because they found it too difficult to attend class, meet family obligations, and at the same time actively seek employment in order to retain unemployment insurance benefits.

## CONCLUSIONS

The Unemployment Tuition Waiver Program has achieved a number of important goals in two semesters:

- It improved the awareness among some of the unemployed about free or low cost educational resources in their communities, especially the community colleges.
- It provided many with an opportunity for personal reorientation, improved job search skills, and increased self confidence.
- In several locations, it initiated collaboration between public colleges and local DES offices.
- It provided college officials with a better understanding of the needs of unemployed workers in their service areas.

There are, however, several areas in which improvement is possible. Barriers exist for both the institutions and potential enrollees which limit the full potential of the program. Lowering the barriers would entail the following:

- improving the coordination between colleges and local E & T agencies, Private Industry Councils, and local Chambers of Commerce to provide up-to-date information on local labor markets for participants and college officials
- instituting greater flexibility in DES regulations to encourage unemployed workers to enroll in retraining programs and to be able to complete coursework without jeopardizing their benefits
- assuring adequate college course and staff resources to handle the additional numbers of worker-students on the campuses
- adapting existing college programs, such as cooperative education, internships and college work study, to help participants gain some work experience in new careers while they they continue to study

- developing clear program timetables and better coordination with service agencies about academic calendars and financial aid deadlines.
- providing additional financial support for participants to cover books and non-tuition fees; and
- establishing a fund to develop comprehensive college-based programs for the unemployed to which public institutions might apply on a competitive basis.



## MODELS OF EMPLOYER-BASED TRAINING PROGRAMS

Corporate training programs are an important source of worker training, particularly for upgrading existing skills. Little is known, however, of these programs. Estimates of corporate expenditures on education and training range from \$2 billion to \$100 billion nationwide. As advances in technology quicken the pace of changes in markets and manufacturing processes, the importance of corporate training programs increases. They provide the most direct and targeted ways for workers to maintain jobs by learning the new skills required by changing conditions. From the company's point of view, they are the best way to maintain a stable workforce during a period of technological change. From a national perspective, they may become more important than ever in helping workers develop skills needed to remain employed in coming years.

This section of the Appendix provides models of corporate training programs, developed from examples of company training programs in Massachusetts. They include:

- Retraining to Maintain a Stable Workforce: The Polaroid Corporation
- Training as a Profit-making Activity: The Foxboro Corporation; and
- Training to Meet Labor Shortages through a Consortium Approach: The shoe and the machining industries.

### RETRAINING TO MAINTAIN A STABLE WORKFORCE: THE POLAROID CORPORATION

As new technology and/or changes in the marketplace render particular products or manufacturing processes obsolete, the job structure and skill needs within a company may shift rapidly and dramatically. Some job categories become unnecessary, while new job skill needs emerge. Increasingly, corporate managers are faced with the difficult decision about what to do with long-term employees in declining job categories.

Some firms lay off such individuals, thereby creating dislocated workers. The operating philosophy of other companies acts to resist such layoffs. Voluntary severance programs, attrition and other means are devised to avoid layoffs.

The Polaroid Corporation of Cambridge is one of many firms which has been reducing its workforce. Polaroid has traditionally sought to avoid layoffs, particularly among salaried and skilled personnel. Over the years the company has operated an active Trades Apprentice Program where outside classroom education is combined with on-the-job training. Using this program as a point of departure, corporate training staff identified a need for electronic technicians and put together a retraining program for workers in declining job categories.

### Description

Having identified skill needs, Polaroid encouraged workers in redundant positions to volunteer for retraining to become electronic technicians. The company's training staff negotiated with Wentworth Institute in Boston to provide off-site classroom training. The curriculum was jointly developed by Polaroid and Wentworth staff. Participants attend classes part-time and receive on-the-job training during the rest of the day. The program takes approximately one year. At the end of training, Polaroid employees move into full-time positions with wages equal to current pay levels. Fifteen Polaroid employees enrolled in this program.

Polaroid and Wentworth sought funding from BSSC. A grant of \$65,000 was awarded to Wentworth to cover training salaries, supplies and materials, and some overhead expenses. Total program costs exceed \$200,000. Polaroid pays for books, tutoring and monitoring of student progress. They also cover by far the greatest cost, wages and time away from work.

A condition of BSSC support was that some program slots be opened to unemployed individuals recruited through Wentworth. Four such participants are currently enrolled.

At the end of the first program semester, January 1984, all 15 Polaroid employees were still participating. One person had an incomplete, but all thus far had been reasonably successful. Polaroid staff noted that all participants were doing well at work, but required more tutorial and other support services than expected in order to stay in the program.

The Polaroid-Wentworth relationship has proceeded smoothly. Potential problems are averted by successful communication between the two organizations.

### Replication Issues

When this program was first developed, Polaroid training staff were familiar with the issues and requirements of such an undertaking. There are plans to utilize this model to



retrain workers in other surplus positions to meet new corporate skill needs.

Replication issues identified by Polaroid include timing, getting higher level corporate managers to recognize the need for such programs, and the cost in terms of wages and time away from work. Timing is important since implementing a worker selection process and designing the training program must be accomplished before it can begin. Unless there is a crisis, corporate managers are not always inclined to understand or support the need for all this additional activity.

Polaroid liked having the BSSC grant go directly to Wentworth. (All BSSC grants are provided to the training institutions which cooperate with the companies.) This allowed Polaroid to concentrate on program and employee-related matters instead of the program's fiscal management.

BSSC normally requires that employers commit to giving trainees a 10% wage increase at the end of the training program. Polaroid was exempted from this requirement because of the job retention characteristics of this program.

BSSC is interested in replicating this model, especially when the 10% wage increase requirement can be met. With or without BSSC funding, the model of retraining employees within the company for growing job needs is an extremely valuable alternative to layoffs. The critical issue for many firms might be the ability to pay wages during the retraining period, and the capacity to forecast the need for such retraining efforts before the situation reaches crisis proportions. Certainly, the funding assistance of BSSC would be a plus.

The benefits to a corporation of retaining employees who have long since become a part of the firm's culture are considerable, and the benefits of such retraining for the employees are obvious.

#### TRAINING AS A PROFIT-MAKING ACTIVITY: THE FOXBORO CORPORATION

The Foxboro Corporation has been manufacturing process measurement and control equipment for 75 years. Even before World War II, the company realized a need to keep the company's customers abreast of technological change and product applications. To accomplish this, the company introduced training for sales and other customer service personnel. Dramatic technological change and an understanding that training is "good for business" have increased the firm's commitment to education and training.



Today, Foxboro operates 14 formal training centers worldwide. In Massachusetts, a new facility opened in March 1982, adjacent to the company's Foxboro headquarters. While the majority of training is focused on sales, service and customer programs, the company has been increasing its internal training and upgrading efforts. As an alternative to constant employee turnover when skills are made obsolete by product and process technology changes, the company offers workers access to state-of-the-art knowledge and skills or opportunities to transfer to other areas within the company.

Foxboro takes an unusual approach to training. Rather than treat training as an overhead activity, this company runs the training facility as a for-profit operation. Services range from media training packages to comprehensive educational programs for personnel. Services marketed to corporate customers of Foxboro constitute 75% of the facility's business. The remaining 25% responds to Foxboro employee training needs.

#### Description

The Foxboro training facility in Foxboro, Massachusetts employs 40 full-time instructional and 15 additional staff. The facility itself was designed with fully equipped classrooms, laboratories, study rooms, and lounges. Training combines theoretical classroom learning with "hands-on" practical applications and problem solving. The costs for operating the training facility are covered by the tuition paid by corporate customers, sale of audio-visual training packages, special training activities done on request, and charges out to Foxboro departments for employee training.

Internal training and upgrading programs are aimed at middle-level employees. Clerical and non-exempt job categories are not targeted for training through this facility. Management training, while sometimes located in the facility, is offered through Foxboro's Personnel Department.

By and large, the courses run by the facility are for workers referred by their supervisors. The goal of the training is related to individual growth, performance, need for technical upgrading, or need to broaden the range of existing skills. Foxboro's performance appraisal system is quite structured. Once a year, a review is conducted and cosigned by the supervisor and employee. Part of the review relates to the future growth of the individual in terms of job objectives and the training needed to achieve them. Division managers have training budgets for which monthly priorities are established. Approvals for employee training are routinely given.



The Job Opportunities Program provides "shortfall" training for workers who are hired into jobs "out of area." Their supervisors can request training to help fill the worker's skill gaps. Training facility staff also provide custom training for entire Foxboro departments that must upgrade in order to meet new technology requirements. Foxboro also collaborates with a variety of professional associations to offer training for employees which can then be certified in particular skill areas. The Community College of Rhode Island also uses the facility to offer training courses designed exclusively for Foxboro employees.

Each year, between 4,000 and 5,000 individuals participate in the facility's programs, of which 1,000 are Foxboro employees.

### Replication Issues

Development of training programs on the scale that exists in Foxboro would require a clear corporate commitment to training throughout the organization and an investment that may not be possible for many firms. Adapted, however, the model could be replicated. A company with a customer service network could build internal training programs around that base.

High level corporate commitment is essential. Training and development must be tied directly to the company's objectives and needs. The company must be able to identify the costs and benefits of training. It must also strongly value the "human factor" and desire a stable workforce. Training must be viewed as a service that can be marketed.

### TRAINING AT AN INDUSTRY LEVEL: THE SHOE AND MACHINING INDUSTRIES

There are particular industries or sometimes firms in selected geographic areas that have difficulty finding and keeping a skilled workforce. In such situations, training becomes an important consideration. Improvement in productivity among current employees are sought through upgrading training. At the same time, increasing the pool of skilled workers is desired. Frequently, individual firms cannot afford to offer training for either entry level or current employees. Formation of a consortium of firms with similar skill needs can provide a solution.

### The Shoe Industry

In the Greater Merrimack Valley area of Massachusetts, as elsewhere, the shoe industry is declining. Yet, many firms continue to survive. Industry representatives are



concerned that the image of a dying industry makes it difficult for strong firms to attract new labor.

Description: The initial concept of a shoe training institute for superintendents, foremen and machinists was generated in 1982 by the President of the New England Superintendents and Shoe Foremen's Association. He solicited the assistance of the Regional Director of the Massachusetts Department of Commerce and Development, who in turn enlisted the cooperation of Northern Essex Community College and the Mayor of Lawrence. The plan was to develop a shoe institute under the direction of the College's Center for Business and Industry. The institute would have two components: management training for superintendents and foremen in theory, practice, and background in manufacturing techniques; and hands-on training for manufacturing personnel.

According to the Director of the Center, initial enthusiasm was high. Corporate managers of five shoe companies pledged their support and an Advisory Board was formed to assist with the institute's development. Following an initial series of meetings, six topics were selected for the management training component for superintendents and foremen. Six three-hour seminars focusing on human relations, industrial engineering, accounting, and other topics were held in the fall of 1983. However, the target group--superintendents and foremen--did not attend. They sent subordinates in their place.

In spite of corporate commitments of space, equipment and materials, the hands-on training component for operators never got off the ground. External funds were not secured for training, and the effort appears to have stalled.

Problems: The Director of the Center for Business and Industry identified several problems in this consortium effort to provide training. First, he suggests that while the companies and the Association were enthusiastic, there never was full agreement on what needed to be done. Furthermore, the superintendents and foremen represent a low to middle level within the industry structure. Thus, the effort never had support from the highest company levels. That the management training seminars were not attended by the Association members initiating the program indicated a serious lack of commitment to the project. Finally, the Center was unable to involve shoe industry managers in teaching the seminars. The Advisory Board apparently neither volunteered its own resources nor could it identify others who might help.

Strengths/Future Potential: In spite of its problems, the shoe institute still has potential. The core elements (the Association, member awareness and initial support) still exist. The problem seems to be one of motivation, and



identifying someone who can pull participants together to develop exactly what the goals of the program should be.

### The Machining Industry

The National Tooling and Machining Association has national experience in establishing training programs in the machining trades. The Boston Chapter, with 112 member companies, decided to establish an institute to address the training needs of members having difficulty locating and retraining skilled workers.

Description: Initially, members of the Boston Chapter donated equipment, training materials and supplies. The Chapter provided some funds to rent a training facility in Woburn and a non-profit Institute was created. Member companies assisted in screening participants, hiring graduates and identifying candidates for upgrading. A substantial BSSC grant was obtained to pay for staff and other related costs.

The program is supposed to have two components, entry level and upgrading training. To date, upgrading training has not yet begun. The entry-level program is currently tuition-free. Training is conducted in three cycles of 16 weeks, with 20 trainees in each cycle. Much of the training is hands-on, with classroom curriculum including blueprints, mathematics, and job orientation. The project will run through April 1984 and has a goal of training 60 people.

Problems: The two most significant problems are recruitment and retention of trainees and implementation of the upgrading component. There is also a question as to how the program can continue after expiration of BSSC funding. It appears that company interest declined during the recent recession because the need for skilled workers was reduced. Whether interest will resume may be linked to the economic climate.

The upgrading component may suffer because small companies have difficulty in releasing people for training. Yet, smaller firms are the ones with the greatest need for more skilled workers. As workers in small shops gain expertise, they are often hired away by larger firms. Smaller companies are therefore reluctant to finance upgrading training for they fear that their investment will be counter-productive.

The problem of continuing the program after expiration of BSSC funding remains. It may be that participating companies will increasingly find the program to be a valuable source of workers and therefore increase their commitments. Tuition charges may also be considered to offset program costs.



A special problem relating to unemployed recruits was identified by Abt Associates of Cambridge in an evaluation of BSSC. DES does not always allow trainees to continue receiving UI benefits while they are being trained, since some individuals are considered "job ready" without the program. This can represent a serious barrier to employee retention. DES is aware of this problem and is working to correct it.

Strengths/Future Potential: This consortium training program has strong employer support and addresses a skill shortage area. The experience of the National Tooling and Machining Association was an asset, as it had established similar programs elsewhere.

Replication Issues: For a successful consortium approach to training to work, a critical factor appears to be the involvement and commitment of corporate officials at the highest levels of their respective organizations. Lower level staff involved in the design and implementation of the program need the support of their superiors.

Training programs cost money. Employers participating in consortia must be willing to contribute training funds, equipment, instructors and/or materials. Seeking and obtaining external funds may assist in program start-up, but BSSC, as well as other programs, often require employer matching of resources. Ultimately funds must be committed in an on-going way for the program to continue.

Drawing instructors from the industry appears to increase the value of the program. Companies are more willing to send their employees and accept new hires if the training has been provided by an individual whose experience they know and trust.

Those taking a consortium approach will find it valuable to identify an individual to act as its coordinator. Organizing an advisory board, recruiting, managing the relationships with the training institution, and overseeing the direction of the program is time-consuming but necessary.

Creation of a consortium for the training of entry-level workers may be easier than for upgrading skills of current employees. The issues associated with such upgrading--time off from work, fears of losing upgraded employees, and identifying which positions are most appropriate for upgrading--are complex. Creation of consortia for upgrading training might need an extra boost from BSSC, the community colleges and other external parties to get off the ground.



## CONCLUSIONS

Employer-initiated training programs can be valuable in upgrading and retraining current employees and in structuring training for entry-level positions. Whether such efforts are done internally or with the assistance of educational institutions, trade associations and public sector support, they require considerable commitment of personnel and funding on the part of employers. The models presented here show the variation in company abilities and needs.

From a public policy perspective, it makes sense to support such employer-initiated efforts wherever possible. This support can take many forms:

- funding assistance of the type BSSC provides
- flexibility in public sector programs to increase the effectiveness of such programs
  - giving BSSC the ability to adapt its requirements to the wide range of situations it encounters
  - making sure DES administration of U.I. benefit requirements does not stand in the way of program participation; and
- making sure that companies and workers know about the wide range of training program opportunities within the state by marketing them more aggressively.
  - BSSC could begin to identify industries and firms where retraining for job retention might be applicable.
  - Community colleges could follow the example of Northern Community College and reach out to local industries to identify training needs.

## SUMMARY

This Appendix has focused on some of the major issues of employment and training as they may affect workers in mature industries. A large part of the Commission's work in this area required an understanding of the entire E & T system. As a result, many of the Commission's recommendations address the structure and operation of the entire system. However, as mentioned earlier, this effort was limited because of the lack of a coherent strategy for the state's E & T services.

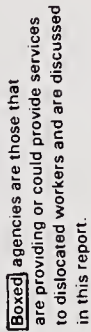
The Commission recommends that the Commonwealth proceed to analyze the programs now in operation and assess the success of major programs and the pattern of current funding. It should also attempt to estimate the size of various target groups (such as dislocated workers) and the costs of providing various services. Priorities could then be established within budget limitations. This would provide much-needed guidelines for program planners.

In addition, ways to coordinate programs and maximize the use of scarce public resources should be developed. Because much of the program design function of the E & T system is rightly decentralized to the regional level, the PICs ought to be utilized more effectively as a coordinating mechanism. Currently, the PICs oversee only those programs funded through JTPA. One way to accomplish more efficient coordination of service provision would be to give the local PICs the authority to "sign-off" on all E & T programs within their respective regions. Funding relationships would not be changed. This required "filing" of programs would give one agency within each region the responsibility of identifying programs which unnecessarily overlap; the ability to target programs to priority groups in the region; and the opportunity to centralize information about all local programs.

The Dislocated Workers Task Force was charged to recommend programs for assisting dislocated workers. As a result, this Commission looked for ways to complement its proposals, rather than duplicate the work its members performed. As a result, the Commission's recommendations address ways to improve the provision of E & T services generally, with special emphasis on those program areas which apply to skilled workers needing retraining. The recommendations are discussed in the body of the Commission's report.



## EXHIBIT 1



**Source:** Bay State Skills, Commission on the Future of Mature Industries

## EXHIBIT 2

### Employment and Training Service Providers: Services Offered

SERVICES	PROVIDERS					PROVIDERS		
	DIVISION OF EMPLOYMENT SECURITY	SDAs/PICs (JTPA OFFICE) *	VOCATIONAL SCHOOLS (DOE) *	GRANTEES (BSSC) *	COMMUNITY COLLEGES (BOARD OF REGENTS)	DEPARTMENT OF PUBLIC WELFARE	DEPARTMENT OF ELDER AFFAIRS	DEPARTMENT OF COMMUNITY DEVELOPMENT
ASSESSMENT, COUNSELING & JOB SEARCH	X	X	X	X	X		X	
JOB DEVELOPMENT & JOB PLACEMENT	X	X	X	X			X	
REFERRALS FOR JOB DEVELOPMENT & JOB PLACEMENT		X	X	X	X	X		X
REFERRALS FOR TRAINING	X	X		X		X		X
OCCUPATIONAL TRAINING		X	X	X	X			
TRAINING TAILORED TO THE NEEDS OF EMPLOYERS***		X	X	X	X			
JOB MATCHING SERVICES FOR EMPLOYERS	X	X		X				
LABOR MARKET INFORMATION DEVELOPMENT**	X	X						
INTER-AGENCY COORDINATION OF SERVICES	X	X		X				

\* Agencies in parentheses are funding agencies only.

\*\* Most agencies use the Division of Employment Security as a primary source of labor market information; many agencies also gather information through their own field representatives.

\*\*\* The extent to which this is done varies from one provider to another; BSSC and the Division of Apprentice Training Programs are most specifically designed to meet employer needs.



### EXHIBIT 3

## Employment and Training Service Providers: Clients Served

<u>CLIENTS</u>	<u>PROVIDERS</u>				
	<u>DIVISION OF EMPLOYMENT SECURITY</u>	<u>SDAs/PICs (DMD)</u>	<u>VOCATIONAL SCHOOLS (DOE)</u>	<u>GRANTEES (BSSC)</u>	<u>COMMUNITY COLLEGES (BOARD OF REGENTS)</u>
<u>WORKERS:</u>					
ALL WORKERS	Employment Service Unemployment Insurance		Post-secondary adult programs		X
DISLOCATED WORKERS	JTPA - Title III Trade Act*	JTPA - Title III Possibly some of Title IIa	Contract: JTPA Contract: BSSC	Especially public sector workers	Contract: JTPA Contract: BSSC
DISADVANTAGED WORKERS	Contract: JTPA Contract: DPW	JTPA - Title IIa Contract: DPW	Contract: JTPA Contract: DPW	Displaced homemakers Welfare recipients (Contract: DPW)	Contract: JTPA Contract: DPW
OLDER WORKERS		JTPA - Title IIa 3% Governor's discretionary		Mentally retarded	
VETERANS	Intensive Employment Services for Veterans  Emergency Veterans Employ- ment Jobs Act	JTPA - Title IVc			X
YOUTH		JTPA - Titles IIa & b	Especially in-school programs		
<u>EMPLOYERS:</u>					
DECLINING INDUSTRIES	X	Through PICs		X	
GROWTH INDUSTRIES	X	Through PICs		X***	

### EXHIBIT 3 (continued)

<u>CLIENTS</u>	<u>PROVIDERS</u>			
	<u>DIVISION OF APPRENTICE TRAINING</u>	<u>DEPARTMENT OF PUBLIC WELFARE</u>	<u>DEPARTMENT OF ELDER AFFAIRS</u>	<u>DEPARTMENT OF COMMUNITY DEVELOPMENT</u>
<u>WORKERS:</u>				
ALL WORKERS	If eligible for apprentice training			
DISLOCATED WORKERS		Some, especially in two parent families		
DISADVANTAGED WORKERS		X	X	Public housing residents only
OLDER WORKERS			X	
VETERANS	Preference given to Veterans			
YOUTH	Preference given for placements	Working age children in AFDC families		Special youth grants
<u>EMPLOYERS:</u>				
DECLINING INDUSTRIES	X			X
GROWTH INDUSTRIES	X			X

\* Trade Adjustment Assistance Act offers services only to workers dislocated because of foreign competition.

\*\* BSSC offers services to all employers, however, growing companies are more likely to use them.



**EXHIBIT 4**  
**Employment and Training Programs\* in Massachusetts**  
**Number of Programs/Service Delivery Sites**  
**Fiscal Year 1984**

<u>STATE AGENCY</u>	<u>NAMES/NUMBERS OF PROGRAMS</u>	<u>SERVICE DELIVERY SITES</u>
<u>DIVISION OF EMPLOYMENT SECURITY</u>  Programs developed at the state level and operated at the local level.	1. Employment Security.** 2. Unemployment Insurance Claims.** 3. Trade Adjustment Assistance Act. 4. Veterans' Services. 5. Emergency Veterans' Employment Jobs Act.** 6. Dislocated Workers Program (intensive services).	1. Thirty-seven local offices. 2. Thirty-six local offices. 3. Thirty-six local Unemployment Insurance Claims offices. 4. Thirty-seven Employment Service offices. 5. Thirty-seven Employment Service offices and thirty-six Unemployment Insurance Claims offices. 6. Sixteen selected Employment Service offices.
<u>JOB TRAINING PARTNERSHIP ACT OFFICE</u>  Programs developed and operated at the local level.	1. JTPA-Title IIa: programs for the disadvantaged (250 individual programs). 2. JTPA-Title III: five programs for dislocated workers. 3. JTPA-Title IVc: Veterans programs (number unknown).	1. Fifteen local SDAs/PICs (many programs contracted out to local providers). 2. Five selected SDAs/PICs (some services contracted out to local providers). 3. Selected SDAs/PICs.
<u>DIVISION OF OCCUPATIONAL EDUCATION</u>  Programs developed and operated at the local level.	1. Nineteen short-term, adult training programs. 2. Post secondary, adult, vocational education programs.	1. Nineteen regional vocational education schools or public school systems. 2. One or more programs at each of twenty-three regional vocational schools.
<u>BAY STATE SKILLS CORPORATION</u>  Some programs developed under contracts with other state agencies.  Some programs developed jointly by firms or unions and local education institutions.	1. Thirty-one skills training contracts.** 2. Five displaced homemaker contracts. 3. Twenty supported work programs for mentally retarded. 4. Fourteen contracts for programs for welfare recipients.  • Seventy programs currently (about 125 program contracts developed since January 1982).	1. Thirty-one educational institutions. 2. Five regional multiservice displaced homemakers centers. 3. Twenty sites. 4. Fourteen sites.

## EXHIBIT 4 (continued)

<u>STATE AGENCY</u>	<u>NAMES/NUMBERS OF PROGRAMS</u>	<u>SERVICE DELIVERY SITES</u>
<u>BOARD OF REGENTS</u>  Programs developed and administered by individual community colleges. (Programs at state four year colleges and universities not included here).	1. Over four hundred vocation-oriented Associate Degree or Certificate programs.**  2. The Tuition Waiver Program for unemployed workers.	1. Fifteen regional community colleges.  2. Offered at most community colleges.
<u>DIVISION OF APPRENTICE TRAINING</u>  Individual apprenticeships developed jointly by firms and unions.	1. Currently monitoring 6200-6300 active apprenticeships.	1. Thirty-seven local Employment Service offices of the Division of Employment Security (intake and assessment).  2. Number of firms with apprentice programs not available.
<u>DEPARTMENT OF PUBLIC WELFARE</u>  Programs developed by other state and local agencies under contract to the Department.	1. The Work Incentive Program (WIN) for Aid to Families with Dependent Children recipients. **	1. Service delivery contracted out to numerous agencies with local delivery sites.
<u>DEPARTMENT OF ELDER AFFAIRS</u>	1. Senior Aid Program: part-time work in 309 slots.**  2. JTPA-Title IIa: older workers grants (number of programs not yet determined).**	1. Individual work sites (number not available).  2. Local SDAs/PICs.
<u>DEPARTMENT OF COMMUNITY DEVELOPMENT</u>  Funds allocated to eleven municipal housing authorities, who contract for services with local vendors.	1. Employment and Training Services: for public housing residents.**  2. Youth Employment and Training Programs: for public housing residents.	1. Eleven municipal housing authorities (unknown number of service provision sites).  2. Municipal housing authorities (unknown number of service provision sites).
	<u>PROGRAMS - TOTAL</u>	<u>SERVICE SITES - TOTAL</u>
	Over 800 programs (some statewide, some local). Figure does not include individual job slots.	Over 170 sites. (Where several programs are offered at same site, that site is counted only once. Sites of individual job slots are not included. Many unknown sites are not represented.)

\* The term "program" is used to designate individually funded operations which may be administered only in one location (such as individual SDA or BSSC contracts) or statewide services operated at many locations (such as the DES Employment Service and Unemployment Insurance Claims Programs).

\*\* These programs probably serve a substantial number of dislocated workers (numbers unknown) or would be appropriate for certain large groups of dislocated workers.

Programs contained in boxes are those which are explicitly targeted to dislocated workers.



# **EXHIBIT 5** **Public Funding for Employment and** **Training Programs in Massachusetts** **Fiscal Year 1984**

<u>ADMINISTRATIVE AGENCY/PROGRAMS</u>	<u>TOTAL FUNDS ALLOCATED</u>	<u>POTENTIAL FUNDS FOR DISLOCATED WORKERS</u>
<u>DIVISION OF EMPLOYMENT SECURITY</u>		
Unemployment Insurance Program (Administration only, does not include benefits paid to claimants)	\$31.6 million	Amount unknown, dependent on proportion of program recipients who are dislocated workers.
Employment Service (adminis- tration)	\$24.4 million	Same as above.
Trade Adjustment Assistance Program	\$670,000 (fiscal year 1983)	\$670,000 (fiscal year 1983)
Emergency Veterans Employment Jobs Act	Unspecified amount avail- able to states on first come, first served basis	Amount unknown, dependent on the number of program eligible people who are also dislocated workers.
<u>JOB TRAINING PARTNERSHIP ACT OFFICE</u>		
JTPA-Title IIa (disadvantaged workers) of which:	\$29.3 million of which:	
Distributed Directly to SDAs/ PICs	\$22.8 million	
Governor's Discretionary Funds	\$6.5 million	
Title III (dislocated workers)	\$1.4 million	\$1.4 million with some local matching in the form of in-kind services.
<u>DIVISION OF OCCUPATIONAL EDUCATION</u>		
Allocation for Adult Training Programs of which:	\$4.78 million of which:	
Adult Short-Term Training Grants	\$975,640	Amount unknown, dependent on proportion of clients who are dislocated workers
Allocations to communities for vocational training (secondary schools including regional vocational schools).	\$1.7 million	
Allocations to public community colleges	\$1.25 million	Amount unknown, dependent on proportion of clients who are dislocated workers.
Apprentice training	\$400,000	
Displaced Homemakers Program	\$200,000	
Programs for incarcerated adults	\$250,000	

## EXHIBIT 5 (continued)

<u>ADMINISTRATIVE AGENCY/PROGRAMS</u>	<u>TOTAL FUNDS ALLOCATED</u>	<u>POTENTIAL FUNDS FOR DISLOCATED WORKERS</u>
<u>BAY STATE SKILLS CORPORATION</u>		
Grants allocated to providers of which:	\$3.95 million of which:	
Skills training contracts	\$1.5 million (requires equal match from firms)	Amount unknown, dependent on proportion of clients who are dislocated workers.
Supported Work Program for the mentally retarded	\$1.1 million	
Programs for welfare recipients and displaced homemakers	\$800,000 (allocated by the Department of Public Welfare)	
Unallocated Funds fiscal year 1983	\$600,000	\$600,000 may be targeted to dislocated workers
<u>BOARD OF REGENTS</u>		
Vocation-related training programs, run by fifteen community colleges	\$54 million (represents 64% of the total allocation to community colleges, which is an estimated amount used for vocation-related degree programs).	Amount unknown, dependent on proportion of students who are dislocated workers.
Tuition Waiver Program for unemployed workers	\$1.0 million	Amount unknown, dependent on proportion of program participants who are dislocated workers.
<u>DIVISION OF APPRENTICE TRAINING</u>		
6200-6300 individual apprenticeships in firms throughout Massachusetts.	\$400,000 (through Division of Occupational Education)	Amount unknown, dependent on proportion of apprentices who are dislocated workers.
<u>DEPARTMENT OF PUBLIC WELFARE</u>		
Federal Work Incentive (WIN) Demonstration Program.	\$19.25 million	Amount unknown, dependent on proportion of program participants.
<u>DEPARTMENT OF ELDER AFFAIRS</u>		
Senior Aids Program.	\$1.8 million	Amount unknown, dependent on proportion of program participants who are dislocated workers.
Elder Service Corps.	\$792,000	
<u>DEPARTMENT OF COMMUNITY DEVELOPMENT</u>		
Employment and Training Services for public housing residents.	\$2.325 million (allocated to eleven municipal housing authorities to contract for services.	Amount unknown, dependent on proportion of program participants who are dislocated workers.



**EXHIBIT 6**  
**Department of Public Welfare Funding Allocations**  
**Under its Employment and Training Program**

<u>AGENCY</u>	<u>ACTIVITY</u>	<u>AMOUNT</u>
Division of Employment Security	Job search/placement	\$5.4 million
Job Training Partnership Act	Counseling/assessment	\$1.5 million
Job Training Partnership Act	Training/placement (new performance contract)	\$1.0 million
Bay State Skills Corporation	Training/placement (including displaced homemakers)	\$ .8 million
Community Colleges	Training (tuition payments)	\$ .8 million
Other Education Providers	Training (by RFP)	\$1.0 million







